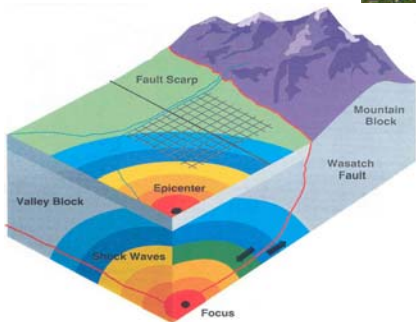


The State of Utah Pre-Disaster Mitigation Plan

November 2004



Governor
Olene Walker

Utah Department of Public Safety
Robert L Flowers

Lt. Governor
Gayle McKeachnie

**Division of Emergency Services &
Homeland Security**
Nannette Rolfe



Utah Department of Public Safety
Division of
Emergency Services

Jurisdictions with Approved and Promulgated Pre-Disaster Mitigation Plans

City/County	Date Approved
Juab County	August 2, 2004
Eureka	August 4, 2004
Levan	September 2, 2004
Mona	August 24, 2004
Nephi	September 21, 2004
Rocky Ridge	July 22, 2004
Millard County	July 26, 2004
Delta	August 12, 2004
Fillmore	August 3, 2004
Hinckley	August 8, 2004
Holden	September 2, 2004
Kanosh	August 11, 2004
Leamington	August 8, 2004
Lynndyl	August 18, 2004
Meadow	September 14, 2004
Oak City	August 26, 2004
Scipio	August 2, 2004
Piute County	September 13, 2004
Circleville	August 23, 2004
Junction	September 14, 2004
Kingston	September 15, 2004
Marysvale	September 2, 2004
Sanpete County	September 7, 2004
Centerfield	August 5, 2004
Ephraim	August 4, 2004
Fairview	September 22, 2004
Fayette	August 5, 2004
Fountain Green	September 14, 2004
Gunnison	July 28, 2004
Manti	September 8, 2004
Mayfield	September 8, 2004
Moroni	August 30, 2004
Mt. Pleasant	July 19, 2004
Spring City	August 5, 2004
Sterling	July 15, 2004
Wales	August 25, 2004
Sevier County	August 2, 2004
Annabella	August 10, 2004
Aurora	September 10, 2004
Elsinore	September 7, 2004

Glenwood	August 11, 2004
Joseph	September 2, 2004
Koosharem	August 5, 2004
Monroe	July 27, 2004
Redmond	August 11, 2004
Richfield	July 15, 2004
Salina	September 8, 2004
Sigurd	September 3, 2004
Wayne County	August 2, 2004
Bicknell	July 15, 2004
Hanksville	August 14, 2004
Loa	July 19, 2004
Lyman	August 31, 2004
Torrey	August 12, 2004
Carbon County	June 16, 2004
East Carbon	June 8, 2004
Helper	June 17, 2004
Price	June 9, 2004
Scofield	July 12, 2004
Sunnyside	June 1, 2004
Wellington	July 28, 2004
Emery County	June 15, 2004
Castle Dale	June 10, 2004
Clawson	July 8, 2004
Cleveland	July 8, 2004
Elmo	August 24, 2004
Emery	June 30, 2004
Ferron	June 24, 2004
Green River	July 13, 2004
Huntington	June 16, 2004
Orangeville	June 10, 2004
Grand County	June 15, 2004
Castle Valley	September 22, 2004
Moab	July 13, 2004
San Juan County	June 7, 2004
Blanding	June 15, 2004
Bluff	June 2, 2004
Monticello	June 23, 2004
Box Elder County	March 30, 2004
Bear River	April 1, 2004
Brigham City	April 1, 2004
Corrine	June 1, 2004
Deweyville	April 8, 2004
Elwood	April 13, 2004
Fielding	April 8, 2004

Garland	April 20, 2004
Honeyville	April 14, 2004
Howell	July 15, 2004
Mantua	July 8, 2004
Perry	April 22, 2004
Plymounth	May 10, 2004
Portage	April 8, 2004
Snowville	April 22, 2004
Tremonton	April 6, 2004
Willard	May 13, 2004
Cache County	April 13, 2004
Amalga	May 12, 2004
Clarkston	July 8, 2004
Cornish	April 8, 2004
Hyde Park	May 26, 2004
Hyrum	May 20, 2004
Lewiston	May 16, 2004
Logan	April 20, 2004
Mendon	September 9, 2004
Millville	April 13, 2004
Newton	August 5, 2004
Nibley	May 20, 2004
North Logan	June 3, 2004
Paradise	July 21, 2004
Providence	May 25, 2004
Richmond	May 14, 2004
River Heights	August 24, 2004
Smithfield	April 28, 2004
Trenton	
Wellsville	May 5, 2004
Rich County	June 2, 2004
Garden City	June 10, 2004
Laketown	April 8, 2004
Randolph	April 14, 2004
Woodruff	April 13, 2004
Beaver County	July 6, 2004
Beaver	July, 13, 2004
Millford	May 18, 2004
Minersville	July 6, 2004
Garfield County	May 24, 2004
Antimony	June 3, 2004
Boulder	June 8, 2004
Cannonville	May 20, 2004
Escalante	June 15, 2004
Hatch	June 8, 2004

Henrieville	July 14, 2004
Panguitch	May 25, 2004
Tropic	May 27, 2004
Iron County	May 24, 2004
Brian Head	June 29, 2004
Cedar	June 9, 2004
Enoch	June 16, 2004
Kanarraville	June 10, 2004
Paragonah	June 9, 2004
Parowan	June 24, 2004
Kane County	June 14, 2004
Alton	July 12, 2004
Big Water	June 22, 2004
Glendale	June 24, 2004
Kanab	May 25, 2004
Orderville	June 2, 2004
Washington County	August 3, 2004
Enterprise	May 26, 2004
Hildale	May 18, 2004
Hurricane	May 20, 2004
Ivins	July 1, 2004
La Verkin	July 7, 2004
Leeds	May 26, 2004
New Harmony	June 2, 2004
Rockville	May 19, 2004
St. George	July 15, 2004
Santa Clara	July 28, 2004
Springdale	June 9, 2004
Toquerville	May 13, 2004
Virgin	May 26, 2004
Washington	June 9, 2004
Summit County	
Coalville	
Francis	October 19, 2004
Henefer	
Kamas	
Oakley	
Park City	
Utah County	September 14, 2004
Alpine	
American Fork	
Cedar Fort	
Cedar Hills	
Eagle Mountain	
Elk Ridge	September 14, 2004

Genola	
Goshen	
Highland	
Lehi	
Lindon	September 7, 2004
Mapleton	October 6, 2004
Orem	October 12, 2004
Payson	
Pleasant Gove	
Provo	
Salem	
Santaquin	
Saratoga Springs	
Spanish Fork	October 19, 2004
Springville	October 19, 2004
Vineyard	
Woodland Hills	September 8, 2004
Wasatch County	
Charleston	September 2, 2004
Heber City	
Midway	
Wallsburg	
Daggett County	July 9, 2004
Manila	July 9, 2004
Duchesne County	July 9, 2004
Altomont	July 9, 2004
Duchesne	July 14, 2004
Myton	July 9, 2004
Roosevelt	July 9, 2004
Tabiona	July 9, 2004
Uintah County	July 9, 2004
Ballard	July 14, 2004
Naples	July 22, 2004
Vernal	July 9, 2004
Davis County	July 13, 2004
Bountiful	August 10, 2004
Centerville	July 6, 2004
Clearfield	September 14, 2004
Clinton	June 22, 2004
Farmington	July 21, 2004
Fruit Heights	August 3, 2004
Kaysville	September 7, 2004
Layton	September 2, 2004
North Salt Lake	July 20, 2004
South Weber	July 13, 2004

Sunset	July 21, 2004
Syracuse	September 14, 2004
West Bountiful	July 20, 2004
West Point	July 20, 2004
Woods Cross	September 7, 2004
Morgan County	July 20, 2004
Morgan	July 13, 2004
Salt Lake County	September 14, 2004
Alta	August 12, 2004
Bluffdale	July 13, 2004
Draper	September 14, 2004
Herriman	July 22, 2004
Holladay	July 15, 2004
Cottonwood	July 15, 2004* not yet a city
Midvale	July 27, 2004
Murray	July 13, 2004
Riverton	September 7, 2004
Salt Lake City	August 10, 2004
Sandy	July 13, 2004
South Jordan	September 7, 2004
South Salt Lake	July 28, 2004
Taylorsville	July 21, 2004
West Jordan	
West Valley City	August 3, 2004
Tooele County	May 25, 2004
Grantsville	September 1, 2004
Ophir	
Rush Valley	
Stockton	June 14, 2004
Tooele	June 2, 2004
Vernon	September 14, 2004
Wendover	June 2, 2004
Weber County	August 3, 2004
Farr West	
Harrisville	June 10, 2004
Hooper	July 15, 2004
Huntsville	
Marriott-Slaterville	July 15, 2004
North Ogden	
Ogden	July 13, 2004
Plain City	
Pleasant View	
Riverdale	July 20, 2004
Roy	August 17, 2004
South Ogden	July 6, 2004

Uintah	
Washington Terrace	July 6, 2004
West Haven	
Paiute Indian Tribe	August 4, 2004
Kanosh Band	August 4, 2004
Koosharem Band	July 30, 2004

Abstract

Title: State of Utah Natural Hazard Mitigation Plan

Authors: Utah Pre-Disaster Mitigation Planning Committee
Ryan Pietramali
Nancy Bar
Bob Carey
Judy Watanabe
Jim Brown

Subject: State of Utah Disaster Mitigation Act of 2000 State
Natural Hazard Mitigation Plan

Date: Draft 1, May 7, 2004

Source of Copies: Utah Department of Public Safety
Division of Emergency Services and Homeland Security
1110 State Office Building
Salt Lake City, Utah 84114
Point of Contact: Ryan Pietramali

Number of Pages:

Abstract: Natural hazards in the State of Utah have caused significant damage due to disasters with subsequent losses of life and property. This plan has been written to address the rising cost of natural disasters, in terms of loss of human life and injuries, and property and natural resources damage. Planning has led to renewed interest in identifying effective ways to reduce vulnerability to disasters. This plan identifies natural hazards with the potential of causing harm to humans and their properties within the state of Utah. Once identified hazards were researched to determine location and identify measure to reduce or eliminate long-term risk from hazards.

This plan addresses seven natural hazards with the potential of causing damage they are earthquakes, floods, landslides, wildfires, dam failure, drought, and sever weather. This plan provides a comprehensive summary of the seven multi-jurisdictional plans completed for the entire state by the seven associations of government. Multi-jurisdictional plans contain locally generated mitigation measures to protect the citizenry of Utah and there property.

Preface

The Utah Division of Emergency Services and Homeland Security is the state's designated coordinating agency for disaster preparedness, emergency response and recovery, and hazard mitigation programs. This State Natural Hazard Mitigation Plan is the latest in a series of documents created under the title of "State Natural Hazard Mitigation Plan" and is intended to guide and direct Utah's mitigation efforts. These mitigation efforts attempt to reduce or eliminate the impact of identified hazards on life, property, and the environment.

This plan represents the end product of a two and half year statewide mitigation planning process. For the first time, this planning process included and encouraged involvement at the city and county level. As a result of this planning process every jurisdiction within the state has met the federal mitigation planning requirement. This planning requirement was accomplished utilizing the Seven Associations of Government who completed seven regional mitigation plans for their respective planning areas.

This plan incorporates the following information under the Disaster Mitigation Act of 2000 (DMA 2000) 44 CFR Part 201.4, Interim Final Rule:

- A description of an effective planning process used to develop this plan,
- Hazard identification and risk assessment of natural hazards which provide the factual basis for activities proposed in the mitigation strategy section,
- A mitigation strategy that provides the state's blueprint for reducing the losses identified in the risk assessment,
- Current and past hazard mitigation programs, (HMGP, FMA, PDM, Project Impact), plans and resources,
- A section on the coordination of local mitigation planning throughout the state,
- A plan maintenance process for monitoring, evaluating, and updating the plan,
- A plan adoption process on the state, regional, and local levels,
- Assurances that the state will comply with all applicable federal statutes and regulation in effect with the respect to the periods for which it receives grant funding,
- Review and updates of the State Natural Hazard Mitigation Plan every three years with submittal to the FEMA Region VIII Director.

By,

Ryan Pietramali
State Mitigation Planner

Executive Summary

Plan Mission

The mission of the State Natural Hazard Mitigation Plan (SNHMP), is to substantially and permanently reduce the states vulnerability to natural hazards. The plan is intended to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the natural environment. This can be achieved by increasing public awareness, documenting resources for risk reduction and loss-prevention, and identifying activities, which act as a guide, to assist the state in becoming safer and more sustainable.

Plan Organization

The SNHMP was developed and organized within the rules and regulations established under CFR Title 44, Part 201.6. The plan contains a discussion on the purpose and methodology used to develop the plan, a profile on state and jurisdiction risk, as well as a hazard identification study and a vulnerability analysis of seven hazards. To assist in the explanation of the above-identified contents several appendices are included which provide more detail on specific subjects. This plan is intended to improve the state's ability to handle disasters, and will document valuable local knowledge on the most efficient and effective ways to reduce loss.

Plan Financing

The SNHMP has been financed and developed under the Pre-Disaster Mitigation Grant Program PDM, provided by the Federal Emergency Management Agency (FEMA). Additional funding was provide through the operating budgets of state and federal agencies participating in the planning process as part of the State Hazard Mitigation Team.

Plan Participation

The SNHMP has been completed as a result of a collaborative effort between the seven Associations of Government, Utah Department of Public Safety Division of Emergency Services, City and County Emergency Managers, State Hazard Mitigation Team members, and citizens and public employees of the cities and counties within Utah. The state plan represents the end product of a two and a half year state wide planning process. This planning process included extensive local input solicited as part of seven multi-jurisdictional plans completed by the associations of government.

Hazards Identified

It was suggested to DES by the State Hazard Mitigation Team that, at minimum, the SNHMP and multi-jurisdictional plans address the hazards of: earthquake, flood, landslide, wildfire, dam failure, severe weather, and drought. This plan in its current state does not and was not required to look at man made or technologic hazards. It is expected in the future this plan will be a holistic mitigation plan which includes natural and man made hazards.

Plan Goals

In an effort to ensure that the mission of the SNHMP is met, the participants in the planning process developed a defined list of goals, which are directly relevant to meeting the mission of the plan.

The following is a list of the goals identified during the planning process, which overall direction to the plan:

- Protection of life before, during, and after the occurrence of a disaster
- Preventing loss of life and reducing the impact of damage where problems cannot be eliminated
- Protection of emergency response capabilities (critical infrastructure)
- Communication and warning systems
- Emergency medical services and medical facilities
- Mobile resources
- Critical facilities
- Government continuity
- Protection of developed property, homes and businesses, industry, education opportunities and the cultural fabric of a community, by combining hazard loss reduction with the community's environmental, social and economic needs
- Protection of natural resources and the environment, when considering mitigation measures
- Promoting public awareness through education of community hazards and mitigation measures
- Preserving and/or restoring natural features that provide mitigation such as floodplains
- Minimize the impacts of flooding
- Minimize the impacts of drought
- Minimize the impacts of severe weather
- Minimize the risk of wildfire
- Minimize the risk of dam failure
- Minimize the impacts of landslides

Acknowledgements

The Department of Public Safety, Division of Emergency Services and Homeland Security would like to acknowledge the following individuals and agencies for their dedication and valuable contribution to this document:

Association of Governments

- Bear River Association of Government
- Five County Association of Government
- Southeastern Association of Governments
- Wasatch Front Regional Council
- Uintah Basin Association of Government
- Mountainlands Association of Government
- Six County Association of Government

Association of Governments Pre-Disaster Mitigation Planning Technical Team

- Ryan Pietramali, DES
- Lane Nielson, WFRC
- LaNiece Dustman, WFRC
- Jeff Adams, SUAOLG
- Jim Boes, WFRC
- Jeff Gilbert, BRAG
- Ken Sizemore, FCAOG
- Curt Hutchings, FCAOG
- Andrew Jackson, MAG
- Emery Polelonema, SCAOG
- Edwin Benson, SCAOG
- Yankton Johnson, UBAOG

Utah Pre-Disaster Mitigation Planning Committee

- Jim Brown
- Judy Watanabe
- Nancy Barr
- Ryan Pietramali
- Bob Carey

United States Army Corps of Engineers

- Scott Stoddard

State of Utah Hazard Mitigation Team

- Utah Geologic Survey
 - Gary Christenson
 - Richard Giraud
 - Francis Ashland
- National Weather Service
 - Dave Toronto

- Brian McInerney
- State Forestry, Fire, and State Lands
 - Dave Dalrymple
 - Tracy Dunford
- United States Army Corps of Engineers
 - Scott Stoddard
- NRCS
 - Robert Rasely
 - Randy Julander
- Department of Environmental Quality
 - Al Jones
 - John Oakeson
 - Kim Dykes
- Utah Department of Transportation
 - Jim McMinimee
- United States Army Corps of Engineers
 - Scott Stoddard
- Department of Natural Resources
 - Darren Rasmussen
 - Ken Short
 - Bill Bradwisch
 - Matt Lindon
- Utah Department of Agriculture
 - Kyle Stephens
- Division of Emergency Services
 - Bob Carey
 - Judy Watanabe
 - Ryan Pietramali
 - Nancy Barr
- USGS
 - Paul Lambert

Local and County Governments

University of Utah

FEMA Region VIII

- Doug Bausch
- Tony Mendes
- Mike Hillenburg
- Heather Leigh

Table of Contents

Section One Introduction

List of Acronyms and Recognized Abbreviations	1
Introduction	2
Scope	3
Purpose	3
Authority	3
Assurances to Comply with Federal Laws and Regulations	5
Planning Process	15
State Natural Hazard Mitigation Planning Process	17
Coordination Among State Agencies	22
Integration With Ongoing Planning Efforts	27
State Background	35

Section Two Identifying Hazards

Disaster History	1
Vulnerability Analysis Methodology	9
 Dam Failure	
Profiling Hazard Event	16
Assessing Vulnerability by Jurisdiction	18
Estimating Potential Losses by Jurisdiction	19
Assessing Vulnerability by State Facilities	19
Estimating Potential Losses by State Facilities	20
 Drought	
Profiling Hazard Event	22
Assessing Vulnerability by Jurisdiction	26
Estimating Potential Losses by Jurisdiction	27
Assessing Vulnerability by State Facilities	27
 Earthquake	
Profiling Hazard Event	28
Assessing Vulnerability by Jurisdiction	36
Estimating Potential Losses by Jurisdiction	36
Assessing Vulnerability by State Facilities	37
Estimating Potential Losses by State Facilities	39
 Flooding	
Profiling Hazard Event	41
Assessing Vulnerability by Jurisdiction	47
Estimating Potential Losses by Jurisdiction	49
Assessing Vulnerability by State Facilities	51
Estimating Potential Losses by State Facilities	51

Landslides	
Profiling Hazard Event -----	53
Assessing Vulnerability by Jurisdiction -----	56
Estimating Potential Losses by Jurisdiction-----	57
Assessing Vulnerability by State Facilities -----	57
Estimating Potential Losses by State Facilities-----	58

Severe Weather	
Profiling Hazard Event -----	60
Assessing Vulnerability by Jurisdiction -----	65
Estimating Potential Losses by Jurisdiction-----	65
Assessing Vulnerability by State Facilities -----	66
Estimating Potential Losses by State Facilities-----	66

Wildfire	
Profiling Hazard Event -----	68
Assessing Vulnerability by Jurisdiction -----	73
Estimating Potential Losses by Jurisdiction-----	74
Assessing Vulnerability by State Facilities -----	76
Estimating Potential Losses by State Facilities-----	77

Maps

Property Damage 1970-2004 -----	78
Crop Damage 1970-2004 -----	79
Drought Vulnerability & Rank -----	80
Drought Vulnerability-----	81
Vulnerability of State Facilities to Dam Failure Inundation -----	82
Flood Vulnerability -----	83
Earthquake Vulnerability -----	84
Vulnerability of State Facilities to Landslide -----	85
Vulnerability to State Facilities to Wildfire-----	86
Losses per Square km-1990s-----	87
Total Losses 1990s -----	88
County Wildfire Risk Maps -----	89

Section Three Mitigation Strategies

Mitigation Strategy Concept -----	1
Dam Safety -----	3
Drought -----	6
Earthquake-----	10
Flood -----	12
Landslide -----	16
Severe Weather -----	19
Wildfire -----	22
All Hazard -----	27

Section Four Conclusion

Local Capability Assessment -----	1
Federal Mitigation Funding Sources & Capabilities -----	6
State Mitigation Capabilities -----	18
Local Mitigation Planning Coordination -----	39
Integrating Local Mitigation Planning -----	40
Prioritizing Local Assistance -----	41
Plan Maintenance Procedure -----	42
Monitoring Progress -----	45
References -----	46
List of Acronyms and Recognized Abbreviations -----	47
Glossary of Terms -----	48

Section Five Local Mitigation Strategies

County Mitigation Strategies -----	2-180
------------------------------------	-------

List of Appendices

Appendix A	Public Comments
Appendix B	Hazard Mitigation Menu
Appendix C	Strategic Plan for Earthquake Safety in Utah USSC January 1995 and Earthquake Safety in Utah “A Progress Report on the Activities and Accomplishments of the Utah Seismic Safety Commission December 2000.
Appendix D	The Map Modernization Program Business Case Plan
Appendix E	Map Modernization Plan for Utah
Appendix F	Palmer Drought Severity Index
Appendix G	State Drought Response Plan
Appendix H	Utah Partners For Conservation and Development Drought Assessment and Mitigation State of the State
Appendix I	Seven Multi-Jurisdictional Mitigation Plans Completed by the Seven Associations of Government.
Appendix J	Dam Safety Priority Listing

Appendix K
Utah

The Feasibility of Collecting Accurate Landslide-Loss Data in

Appendix L

Jordan Valley Water Conservancy District Hazard Mitigation
Strategy

All of the appendices are electronic located in the CD sleeves at the back of the plan.
Hard copies can be obtained by contacting:

Utah Department of Public Safety
Division of Emergency Services and Homeland Security
1110 State Office Building
Salt Lake City, Utah 84114
Point of Contact: Ryan Pietramali

List of Acronyms and Recognized Abbreviations

AGRC	Automated Geographic Reference Center
AOG	Association of Governments
Assoc.	Association
ATV	All Terrain Vehicle
Bldg.	Building
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
Bur.	Bureau
Corp.	Corporation
CRS	Community Rating System
Dept.	Department
DESHS/DES	Division of Emergency Services and Homeland Security
Div	Division
DMA 2000	Disaster Mitigation Act of 2000
DOT	Department of Transportation
DNR	Division of Natural Resources
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
ESRI	Environmental Systems Research Institute
FEMA	Federal Emergency Management Agency
FFSL	Forestry Fire and State Lands
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FS	Forest Service
GIS	Geographic Information Systems
HAZMAT	Hazardous Materials
HAZUS MH	Hazards United States
ICS	Incident Command System
LEPC	Local Emergency Planning Committee
MSL	Mean Sea Level
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
OSHA	Occupational Safety and Health Administration
PDM	Pre-Disaster Mitigation
PDSI	Palmer Drought Severity Index
SCS	Soil Conservation Service
SLC	Salt Lake City
SPI	Standardized Precipitation Index
SWSI	Surface Water Supply Index
UFFSL	Utah Forestry, Fire, and State Lands
UGS	Utah Geological Survey
URWIN	Urban-Rural Wildland Interface Zone
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
UT	Utah

Introduction

While a combination of hydrologic, geologic, and wildfire hazards face Utah's diverse landscape and settlements, this plan addresses, primarily flood, wildfire, landslide, earthquake, and drought hazard mitigation. Hazard mitigation planning is the process of analyzing a set of conditions relative to a natural hazard to determine if existing mitigation is adequate to reduce or eliminate impacts should that hazard become active to a prescribed level, for example to the level of the 100-year flood.

All hazards have an associated set of impact-causing conditions, once a hazard becomes active. An important aspect of hazard mitigation planning is to obtain adequate input from skilled professionals who work with specific hazards and their associated impacts. Through such input, the hazard mitigation planner can plan for those impact-causing conditions, which cause an unacceptable threat to life and to property. It is important to note not all threat to life and property is termed unacceptable, because people must accept some risk for living where they do.

The objective of hazard mitigation planning is to describe mitigation measures that can reduce, as much as possible, or eliminate the threat from those unacceptable impact-causing conditions resulting from a hazard that may become active. The identification of what the community feels is an acceptable or unacceptable risk is essential in any mitigation Plan. From this concept of what can be and is being mitigated for, the planner then can assist the community in preparing for the potential threat of the hazard.

For example, within the realm of a hazard, it may be possible to **mitigate** for 40 percent of the potential impact associated with the threat through either structural or nonstructural measures. That being the case, theoretically, one might then be able to adequately **prepare** for the resulting 60 percent of potential impact.

How This Plan is Organized

The SNHMP was developed and organized within the rules and regulations established under CFR Title 44, Part 201.6 of the Disaster Mitigation Act of 2000. The plan contains a discussion on the purpose and methodology used to develop the plan, a profile on state and jurisdiction risk, as well as a hazard identification study and a vulnerability analysis of seven hazards. To assist in the explanation of those items the plan contains a section on each hazard; with appendices providing more detail on specific subjects. This plan is intended to improve the state's ability to handle disasters, and will document valuable local knowledge on the most efficient and effective ways to reduce loss.

How the Plan Should Be Used

This plan was written to provide usefulness in four broad areas. First, the plan should be used to assist state and local agencies in implementing programs and projects which reduce the states overall vulnerability to natural hazards. Second, this plan should be used as an aid to facilitate inter-governmental coordination and collaboration related to natural hazard mitigation planning and subsequent plan implementation. Third, this plan serves as a comprehensive strategy for dealing with natural disasters. Fourth, this plan

will bring the state into compliance with the Disaster Mitigation Act of 2000 and maintain State eligibility for federal mitigation funding.

This mitigation plan similar to all state natural hazard mitigation plans, which have come before, is not a comprehensive end all list of mitigation strategies. This plan is and must continue to be a living document, dynamically changing with Utah's transforming environment and ever-changing technology. For this reason the state maintains the right to add, subtract, or augment this plan as it sees fit to best meet the goals of the plan.

Scope

The Utah Pre-Disaster Mitigation Plan is a statewide plan addressing the natural hazards of dam failure, drought, earthquake, flooding, landslides, severe weather and wildfire. A more detailed focus on local risk and local mitigation can be found in the multi-jurisdictional plans completed by the Associations of Governments, which encompass all twenty-nine counties and two hundred and sixty-five incorporated municipalities, and five Indian tribes. This plan summarizes finding in the AOG document as well as meets state requirements set fourth in the Disaster Mitigation Act of 2000.

Purpose

To fulfill federal, state, and local hazard mitigation planning responsibilities; to promote pre and post disaster mitigation measures, short/long range strategies that minimize suffering, loss of life, and damage to property resulting from hazardous or potentially hazardous conditions to which citizens and institutions within the state are exposed; and to eliminate or minimize conditions which would have an undesirable impact on our citizens, the economy, environment, and the well-being of the state of Utah. This plan is an aid in enhancing state officials, agencies, and public awareness to the threat that hazards have on property and life and what can be done to help prevent or reduce the vulnerability and risk of each Utah jurisdiction.

Authority

Federal

Public Law 93-288 as amended, established the basis for federal hazard mitigation activity in 1974. A section of this Act requires the identification, evaluation, and mitigation of hazards as a prerequisite for state receipt of future disaster assistance outlays. Since 1974, many additional programs, regulations, and laws have expanded on the original legislation to establish hazard mitigation as a priority at all levels of government. When PL 93-288 was amended by the Stafford Act, several additional provisions were also added that provide for the availability of significant mitigation measures in the aftermath of Presidential declared disasters. Civil Preparedness Guide 1-3, Chapter 6- Hazard Mitigation Assistance Programs places emphasis on hazard mitigation planning directed toward hazards with a high impact and threat potential.

The Disaster Mitigation Act of 2000

In the past, federal legislation has provided funding for disaster relief, recovery, and some hazard mitigation planning. The Disaster Mitigation Act of 2000 (DMA 2000) is the latest legislation, was put into motion on October 10, 2000, when the President signed the Act (Public Law 106-390). The new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. As such, this Act establishes a pre-disaster hazard mitigation program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP).

Section 322, of the Act, specifically addresses mitigation planning at the state and local levels. Identifying new requirements that allow HMGP funds to be used for planning activities, and increases the amount of HMGP funds available to states that have developed a comprehensive or enhanced mitigation plan prior to a disaster. States and communities must have an approved mitigation plan in place prior to receiving both pre and post-federal disaster funds. Local and tribal mitigation plans must demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for the risk to and the capabilities of the individual communities.

State governments have certain responsibilities for implementing Section 322, including:

- Preparing and submitting a standard or enhanced state mitigation plan;
- Reviewing and updating the state mitigation plan every three years;
- Providing technical assistance and training to local governments to assist them in applying for HMGP grants and in developing local mitigation plans; and
- Reviewing and approving local plans if the state is designated a managing state and has an approved enhanced plan.

DMA 2000 is intended to facilitate cooperation between state and local authorities, prompting them to work together. It encourages and rewards local and state pre-disaster planning and promotes sustainability as a strategy for disaster resistance. This enhanced planning network will better enable local and state governments to articulate accurate needs for mitigation, resulting in faster allocation of funding and more effective risk reduction projects.

To implement the new DMA 2000 requirements, FEMA prepared an Interim Final Rule, published in the Federal Register on February 26, 2002, at 44 CFR Parts 201 and 206, which establishes planning and funding criteria for states and local communities.

State Authority

- The Governor's Emergency Operation Directive
- The Robert T. Stafford Disaster Relief and Emergency Assistance Act, amendments to Public Law 93-288, as amended.
- Title 44, CFR, Federal Emergency Management Agency Regulations, as amended.
- State Emergency Management Act of 1981, Utah Code 53-2, 63-5.
- Disaster Response Recovery Act, 63-5A.

- Executive Order of the Governor, Executive Order 11
- Emergency Interim Succession Act, 63-5B.

Utah State Code

In Utah Code 53-2-104, it is stated that the Utah Division of Emergency Services* shall:

- (c) prepare, implement, and maintain programs and plans to provide for:
- (i) Prevention and minimization of injury and damage caused by disasters;
 - (iii) Identification of areas particularly vulnerable to disasters;
 - (iv) Coordination of hazard mitigation and other preventive and preparedness measures designed to eliminate or reduce disasters;
 - (v) Assistance to local officials in designing local emergency action plans;
 - (vi) Coordination of federal, state, and local emergency activities;
 - (vii) Coordination of emergency operations plans with emergency plans of the federal government; and
 - (x) Other measures necessary, incidental, or appropriate to this chapter.

* Updated with current name.

Assurances to Comply with Federal Laws and Regulations

The plan must include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with §13.11(c). The State will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in §13.11(d).

Through the development and enforcement of this plan, the assurances listed below are provided as documentation that the state or any subsequent sub-grantee (recipients) that receives federal grant funding will comply with all applicable Federal statutes and regulations. Additionally, the state will amend the plan whenever necessary to reflect changes in Federal and State laws and regulations.

To the extent the following provisions apply to the award of assistance:

- (a) Recipient possesses legal authority to enter into agreements, and to execute the proposed programs;
- (b) Recipient's governing body has duly adopted or passed as an official act a resolution, motion or similar action authorizing the execution of hazard mitigation agreements, including all understandings and assurances contained therein, and directing and authorizing the Recipient's chief administrative officer or designee to act in connection with any application and to provide such additional information as may be required;
- (c) No member of or delegate to the Congress of the United States, and no Resident Commissioner shall be admitted to any share or part of any agreement or to any benefit to arise from the same. No member, officer, or employee of the Recipient or its designees or agents, no member of the governing body of the locality in which the program is situated, and no other public official of such locality or localities

who exercises any functions or responsibilities with respect to the program during his tenure or for one year thereafter, shall have any interest direct or indirect, in any contract or subcontract, or the proceeds thereof, for work to be performed in connection with the program assisted under this plan. The

Recipient shall incorporate or cause to be incorporated, in all such contracts or subcontracts a provision prohibiting such interest pursuant to the purpose state above;

(d) All Recipient contracts for which the State Legislature is in any part a funding source, shall contain language to provide for termination with reasonable costs to be paid by the Recipient for eligible contract work completed prior to the date the notice of suspension of funding was received by the Recipient. Any cost incurred after a notice of suspension or termination is received by the Recipient may not be funded with funds provided under a grant agreement unless previously approved in writing by the Department. All Recipient contracts shall contain provisions for termination for cause or convenience and shall provide for the method of payment in such event;

(e) Recipient will comply with:

(1) Contract Work Hours and Safety Standards Act of 1962, 40 U.S.C. 327 et seq., requiring that mechanics and laborers (including watchmen and guards) employed on federally assisted contracts be paid wages of not less than one and one-half times their basic wage rates for all hours worked in excess of forty hours in a work week; and

(2) Federal Fair Labor Standards Act, 29 U.S.C. Section 201 et seq., requiring that covered employees be paid at least the minimum prescribed wage, and also that they be paid one and one-half times their basic wage rates for all hours worked in excess of the prescribed work-week.

(f) Recipient will comply with:

(1) Title VI of the Civil Rights Act of 1964 (P.L. 88-352), and the regulations issued pursuant thereto, which provides that no person in the United States shall on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Recipient receives Federal financial assistance and will immediately take any measures necessary to effectuate this assurance. If any real property or structure thereon is provided or improved with the aid of Federal financial assistance extended to the Recipient, this assurance shall obligate the Recipient, or in the case of any transfer of such property, any transferee, for the period during which the real property or structure is used for a purpose for which the Federal financial assistance is extended, or for another purpose involving the provision of similar services or benefits;

(2) Any prohibition against discrimination on the basis of age under the

Age Discrimination Act of 1975, as amended (42 U.S.C.: 6101-6107), which prohibits discrimination on the basis of age or with respect to otherwise qualified handicapped individuals as provided in Section 504 of the Rehabilitation Act of 1973;

(3) Executive Order 11246 as amended by Executive Orders 11375 and 12086, and the regulations issued pursuant thereto, which provide that no person shall be discriminated against on the basis of race, color, religion, sex or national origin in all phases of employment during the performance of federal or federally assisted construction contracts; affirmative action to insure fair treatment in employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff/termination, rates of pay or other forms of compensation; and election for training and apprenticeship;

(g) The Recipient agrees to comply with the Americans With Disabilities Act (Public Law 101-336, 42 U.S.C. Section 12101 et seq.), where applicable, which prohibits discrimination by public and private entities on the basis of disability in the areas of employment, public accommodations, transportation, State and local government services, and in telecommunications;

(h) Recipient will establish safeguards to prohibit employees from using positions for a purpose that is or gives the appearance of being motivated by a desire for private gain for themselves or others, particularly those with whom they have family, business, or other ties pursuant to Section 112.313 and Section 112.3135, FS;

(i) Recipient will comply with the Anti-Kickback Act of 1986, 41 U.S.C. Section 51, which outlaws and prescribes penalties for "kickbacks" of wages in federally financed or assisted construction activities;

(j) Recipient will comply with the provisions of 18 USC 594, 598, 600-605 (further known as the Hatch Act) which limits the political activities of employees;

(k) Recipient will comply with the flood insurance purchase and other requirements of the Flood Disaster Protection Act of 1973 as amended, 42 USC 4002-4107, including requirements regarding the purchase of flood insurance in communities where such insurance is available as a condition for the receipt of any Federal financial assistance for construction or acquisition purposes for use in any area having special flood hazards. The phrase "Federal financial assistance" includes any form of loan, grant, guaranty, insurance payment, rebate, subsidy, disaster assistance loan or grant, or any other form of direct or indirect Federal assistance;

(l) Recipient will require every building or facility (other than a privately owned residential structure) designed, constructed, or altered with funds provided under a grant agreement to comply with the "Uniform Federal Accessibility Standards," (AS) which is Appendix A to 41 CFR Section 101-19.6 for general type buildings and Appendix A to

24 CFR Part 40 for residential structures. The Recipient will be responsible for conducting inspections to ensure compliance with these specifications by the contractor;

(m) Recipient will, in connection with its performance of environmental assessments under the National Environmental Policy Act of 1969, comply with Section 106 of the National Historic Preservation Act of 1966 (U.S.C. 470), Executive Order 11593, 24 CFR Part 800, and the Preservation of Archaeological and Historical Data Act of 1966 (16 U.S.C. 469a-1, et seq.) by:

(1) Consulting with the State Historic Preservation Office to identify properties listed in or eligible for inclusion in the National Register of Historic Places that are subject to adverse effects (see 36 CFR Section 800.8) by the proposed activity; and

(2) Complying with all requirements established by the State to avoid or mitigate adverse effects upon such properties.

(3) Abiding by the terms and conditions of the "Programmatic Agreement Among the Federal Emergency Management Agency, the Utah State Historic Preservation Office," which addresses roles and responsibilities of Federal and State entities in implementing Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. 470f, and implementing regulations in 36 CFR part 800.

(4) Notifying FEMA and the state if any project may affect a historic property. When any of Recipient's projects funded under a grant agreement may affect a historic property, as defined in 36 CFR 800. (2)(e), the Federal Emergency Management Agency (FEMA) may require Recipient to review the eligible scope of work in consultation with the State Historic Preservation Office (SHPO) and suggest methods of repair or construction that will conform with the recommended approaches set out in the Secretary of Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings 1992 (Standards), the Secretary of the Interior's Guidelines for Archeological Documentation (Guidelines) (48 Federal Register 44734-37), or any other applicable Secretary of Interior standards. If FEMA determines that the eligible scope of work will not conform with the Standards, Recipient agrees to participate in consultations to develop, and, after execution by all parties, to abide by, a written agreement that establishes mitigation and recondition measures, including but not limited to, impacts to archeological sites, and the salvage, storage, and reuse of any significant architectural features that may otherwise be demolished.

(5) Notifying FEMA and the state if any project funded under a grant agreement will involve ground disturbing activities, including, but not limited to: subsurface disturbance; removal of trees; excavation for footings and foundations; and installation of utilities (such as water, sewer, storm drains, electrical, gas, leach lines and septic tanks) except where these activities are restricted solely to areas previously disturbed by the installation, replacement or maintenance of such utilities. FEMA will

request the SHPO's opinion on the potential that archeological properties may be present and be affected by such activities. The SHPO will advise Recipient on any feasible steps to be accomplished to avoid any National Register eligible archeological property or will make recommendations for the development of a treatment plan for the recovery of archeological data from the property.

If Recipient is unable to avoid the archeological property, it will develop, in consultation with the SHPO, a treatment plan consistent with the Guidelines and take into account the Advisory Council on Historic Preservation (Council) publication "Treatment of Archeological Properties". Recipient shall forward information regarding the treatment plan to FEMA, the SHPO and the Council for review. If the SHPO and the Council do not object within 15 calendar days of receipt of the treatment plan, FEMA may direct Recipient to implement the treatment plan. If either the Council or the SHPO object, Recipient shall not proceed with the project until the objection is resolved.

(6) Notifying the state and FEMA as soon as practicable: (a) of any changes in the approved scope of work for a National Register eligible or listed property; (b) of all changes to a project that may result in a supplemental DSR or modify an HMGP project for a National Register eligible or listed property; (c) if it appears that a project funded under a grant agreement will affect a previously unidentified property that may be eligible for inclusion in the National Register or affect a known historic property in an unanticipated manner. Recipient acknowledges that FEMA may require Recipient to stop construction in the vicinity of the discovery of a previously unidentified property that may be eligible for inclusion in the National Register or upon learning that construction may affect a known historic property in an unanticipated manner. Recipient further acknowledges that FEMA may require Recipient to take all reasonable measures to avoid or minimize harm to such property until FEMA concludes consultation with the SHPO. Recipient also acknowledges that FEMA will require, and Recipient shall comply with, modifications to the project scope of work necessary to implement recommendations to address the project and the property.

(7) Acknowledging that, unless FEMA specifically stipulates otherwise, it shall not receive funding for projects when, with intent to avoid the requirements of the PA or the NHPA, Recipient intentionally and significantly adversely affects a historic property, or having the legal power to prevent it, allowed such significant adverse affect to occur.

(n) Recipient will comply with Title IX of the Education Amendments of 1972, as amended (20 U.S.C.: 1681-1683 and 1685 - 1686) which prohibits discrimination on the basis of sex;

(o) Recipient will comply with the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970, (42 U.S.C. 4521-45-94) Relating to nondiscrimination on the basis of alcohol abuse or alcoholism;

(p) Recipient will comply with 523 and 527 of the Public Health Service Act of

1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records;

(q) Recipient will comply with Lead-Based Paint Poison Prevention Act (42 U.S.C.: 4821 et seq.) which prohibits the use of lead based paint in construction of rehabilitation or residential structures;

(r) Recipient will comply with the Energy Policy and Conservation Act (P.L. 94-163; 42 U.S.C. 6201-6422), and the provisions of the state Energy Conservation Plan adopted pursuant thereto;

(s) Recipient will comply with the Laboratory Animal Welfare Act of 1966, 7 U.S.C. 2131-2159, pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by an award of assistance under this agreement;

(t) Recipient will comply with Title VIII of the Civil Rights Act of 1968, 42 U.S.C. 2000c and 42 3601-3619, as amended, relating to non-discrimination in the sale, rental, or financing of housing, and Title VI of the Civil Rights Act of 1964 (P.L. 88-352), which prohibits discrimination on the basis of race, color or nation origin;

(u) Recipient will comply with the Clean Air Act of 1955, as amended, 42 U.S.C. 7401-7642;

(v) Recipient will comply with the Clean Water Act of 1977, as amended, 42 U.S.C. 7419-7626;

(w) Recipient will comply with the Endangered Species Act of 1973, 16 U.S.C. 1531-1544;

(x) Recipient will comply with the Intergovernmental Personnel Act of 1970, 42 U.S.C. 4728-4763;

(y) Recipient will assist the awarding agency in assuring compliance with the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 270;

(z) Recipient will comply with environmental standards, which may be prescribed pursuant to the National Environmental Policy Act of 1969, 42 U.S.C. 4321-4347;

(aa) Recipient will assist the awarding agency in assuring compliance with the Preservation of Archeological and Historical Preservation Act of 1966, 16 U.S.C. 469a, et seq;

(bb) Recipient will comply with the Rehabilitation Act of 1973, Section 504, 29

U.S.C. 794, regarding non-discrimination;

(cc) Recipient will comply with the environmental standards, which may be prescribed pursuant to the Safe Drinking Water Act of 1974, 42 U.S.C. 300f-300j, regarding the protection of underground water sources;

(dd) Recipient will comply with the requirements of Titles II and III of the Uniform Relocation Assistance and Property Acquisition Policies Act of 1970, 42 U.S.C. 4621-4638, which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally assisted programs;

(ee) Recipient will comply with the Wild and Scenic Rivers Act of 1968, 16 U.S.C. 1271-1287, related to protecting components or potential components of the national wild and scenic rivers system;

(ff) Recipient will comply with the following Executive Orders: EO 11514 (NEPA); EO 11738 (violating facilities); EO 11988 (Floodplain Management); EO 11990 (Wetlands); and EO 12898 (Environmental Justice);

(gg) Recipient will comply with the Coastal Barrier Resources Act of 1977, 16 U.S.C. 3510;

(hh) Recipient will assure project consistency with the approved State program developed under the Coastal Zone Management Act of 1972, 16 U.S.C. 1451-1464; and

(ii) Recipient will comply with the Fish and Wildlife Coordination Act of 1958; 16 U.S.C. 661-666.

(jj) With respect to demolition activities, recipient will:

1. Create and make available documentation sufficient to demonstrate that the recipient and its demolition contractor have sufficient manpower and equipment to comply with the obligations as outlined in a grant agreement.

2. Return the property to its natural state as though no improvements had ever been contained thereon.

3. Furnish documentation of all qualified personnel, licenses and all equipment necessary to inspect buildings located in Recipient's jurisdiction to detect the presence of asbestos and lead in accordance with requirements of the U.S. Environmental Protection Agency, the Florida Department of Environmental Protection and the County Health Department.

4. Provide documentation of the inspection results for each structure to indicate:

- a. Safety Hazards Present

- b. Health Hazards Present
- c. Hazardous Materials Present

5. Provide supervision over contractors or employees employed by Recipient to remove asbestos and lead from demolished or otherwise applicable structures.
6. Leave the demolished site clean, level and free of debris.
7. Notify the Department promptly of any unusual existing condition, which hampers the contractor's work.
8. Obtain all required permits.
9. Provide addresses and marked maps for each site where water wells and septic tanks are to be closed along with the number of wells and septic tanks located on each site. Provide documentation of closures.
10. Comply with mandatory standards and policies relating to energy efficiency that are contained in the State energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163).
11. Comply with all applicable standards, orders, or requirements issued under Section 112 and 306 of the Clean Air Act (42 U.S.C. 1857 (h), Section 508 of the Clean Water Act (33 U.S. 1368), Executive Order 11738, and the U.S. Environmental Protection Agency regulations (40 CFR Part 15 and 61). This clause shall be added to any subcontracts.
12. Provide documentation of public notices for demolition activities.

What is Planning?

It is important to have a good understanding of what is meant by "planning". As a general practice, planning is a way that people figure out how to accomplish a goal or solve a problem. The methods for planning are quite varied, based on what people are trying to do. The following examples of planning in your personal life can be used to understand the different approaches to planning, including mitigation planning.

Sometimes people plan as they go, literally making it up along the way. For example, if you decide to take a weekend drive in the country with your family, the "plan" simply consists of deciding when to leave the house and the general direction you will take to get out of town. As you travel the roadways, your family makes decisions about where to stop, where to turn, and when to head back home, i.e., the plan continues to be developed as it occurs. This type of planning is fine when the desired result is simply to have an experience without a lot of specific expectations.

When there is a more specific goal in mind, a more thoughtful planning approach is required. For example, this time your family needs to visit relatives in a distant city. You research and evaluate your options for traveling, weighing the cost of various transportation alternatives (cars, trains, airplanes, etc.) versus the amount of time it requires for each mode of transport. You decide on a method and a time to travel that meets your needs and budget, make the necessary travel arrangements, and undertake the journey. In so doing, the planning process helps you realize the goal of visiting your relatives using your resources (in this case, time and money) in the most efficient manner. This approach only involves a few simple steps – researching and comparing options, and implementation – and works well to attain a single distinct result.

When the ultimate goal is more complex, however, the planning process required to reach a successful result must account for more issues and takes a little more effort. Suppose you want to plan for your eventual retirement so that you and your spouse will have enough funds to take care of your basic needs and to enjoy yourselves. You (perhaps with the help of a financial advisor) take stock of your resources and earning potential, your likely expenses over time, and options for saving and investing your money to provide different levels of return and security. As part of this process, you evaluate the risk that is inherent in different types of investments, the number of years you will be working and saving, and a host of other factors. During the planning process, you will probably refine and revise your retirement goals as you find out more about what you can realistically accomplish. Also, an important difference in this type of planning process, compared with the previous two examples, is that you will be making decisions about how to start your investment program, but if you are wise, you will revisit your financial plan from time to time to make sure it continues to fit your needs and capabilities.

In doing so, you will have embarked on a long-term planning process that:

- Has an overarching mission (in this example, "attaining financial security") but also allows for flexibility regarding specific actions to be taken as the plan develops;
- Accounts for the interactions of a number of dynamic factors that might influence your decision making; and
- Does not have a finite life span, i.e., ultimate success requires periodic attention through the years to make sure that your mission is attained.

You have also expanded your decision-making framework in such a way that all of the other decisions in your life will now have to consider your financial goals with respect to retirement. Your retirement goals have now become integrated into other important decisions in your life.

Mitigation Planning

Mitigation planning is simply adapting the planning process discussed above to focus on mitigation and hazard reduction. The mitigation planning process in all of its various forms follows several simple steps to reduce the effects of hazards.

Organize resources

From the start, communities should focus the resources needed for a successful mitigation planning process. Essential steps include identifying and organizing interested members of the community as well as the technical experts required during the planning process

Assess risks

Communities need to identify the characteristics and potential consequences of natural hazards. It is important to understand how much of the community can be affected by specific hazards and what the impacts would be for important assets.

Development of the mitigation plan

Armed with an understand of the risks posed by natural hazards, communities need to determine what their priorities should be and then look at possible ways to avoid or minimize the undesired effects. The result is a natural hazard mitigation plan and strategy for implementation.

Implementation of the plan and monitoring of the plans progress

Communities can bring the plan to life in a variety of ways ranging from implementing specific mitigation projects to changes in the day-to-day operation of the local or state government. To ensure the success of an on-going program, it is critical that the plan remains effective. Thus, it is important to conduct periodic evaluations and make revisions as needed.

Adapted from State and Local Mitigation Planning How-to guide Understanding Your Risk FEMA 386-2

Planning Process

The plan must include a description of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how other agencies participated.

The State Department of Public Safety Division of Emergency Services and Homeland Security is the lead agency responsible for coordinating the development of the State Hazard Mitigation Plan. Staff members from DES completed the State Hazard Mitigation Plan with assistance from our most significant partner the State Hazard Mitigation Team. The process utilized by DES to complete the state hazard mitigation plan is two fold. First the state plan is a result of a separate planning process put into motion twenty-four months prior to the state planning process. The initial PDM planning process involved the seven associations of government (AOG). The second process initiated to complete the state natural hazard mitigation plan was a result of a strengthening and augmentation of the process used over the last 15 years, to complete previous state hazard mitigation plans. The state plan and process used to create it, relied heavily on mitigation and program experts from the Division of Emergency Services and numerous state agencies.

Pre-Disaster Mitigation Funding

The Federal Emergency Management Agency (FEMA) provided grant funding to the state, under the Pre-Disaster Mitigation Grant Program. This funding is dependent upon a yearly appropriation from Congress. Once funding is allocate, it is guaranteed, but future funding for mitigation planning, while likely, has been tied to a competitive grant process. To initiate the PDM planning process FEMA's budget contained a non-competitive set aside in federal fiscal year 2002 and 2003. Though expected, the 2004 PDM program contained no planning set aside.

In Federal Fiscal Year 2002 the State of Utah received approximately of \$300,000, \$30,000 of which was used to instigate local planning, a approximately \$270,000, was passed through to locals jurisdictions to complete multi-jurisdictional mitigation plans. In Federal Fiscal Year 2003, Utah received approximately \$248,000; most of this funding was again passed down to local governments in support of the multi-jurisdictional planning initiative. Unfortunately, DES discovered there would be no PDM planning set aside in Federal Fiscal Year 2004 until after the submittal deadline for the PDM-C grant program. This resulted in a funding gap, which left the state with the task of completing the State Natural Hazard Mitigation Plan on a very limited budget.

Association of Government Planning Process

The planning process suggested by the DES and carried out by the seven AOG is being discussed here in brief to explain the utility of having to separate but intergrated planning processes. A more detailed explanation of the planning processes individual Associations used to complete their plans can be found in each of the seven multi-jurisdictional plans. The state contracted with at the AOG to complete a PDM plan for the counties in their

planning area. When the planning requirement in DMA 2000 was released the state determined it would be best to complete regional or multi-jurisdictional mitigation plans rather than single jurisdiction or countywide plans.

At the beginning of the planning process GIS technicians and senior planners from each AOG were asked by the AOG Board of Directors to form a technical PDM planning team. This core group met regularly to share ideas, concentrate limited resources, and ensure plans were similar in methodology selection. State technical assistance was made available to this group through out the process when requested. A member of the Natural Hazard Mitigation Planning Team served as chair of the AOG technical committee to facilitate coordination and ensure needs were fully met.

Table I-1 PDM Technical Team

Name	Organization
Ryan Pietramali, Chair	Utah Division of Emergency Services and Homeland Security
Lane Nielson	Wasatch Front Regional Council
LaNiece Dustman	Wasatch Front Regional Council
Jeff Adams	Southeastern Utah Association of Local Governments
Jim Boes	Wasatch Front Regional Council
Jeff Gilbert	Bear River Association of Governments
Ken Sizemore	Five County Association of Governments
Curt Hutchings	Five County Association of Governments
Andrew Jackson	Mountainland Association of Governments
Emery Polelonema	Six County Association of Governments
Edwin Benson	Six County Association of Governments
Yankton Johnson	Uintah Basin Association of Governments

Regardless of the alterations made by individual AOGs each AOG formed a core PDM planning committee, a County Mitigation Committees, and participated in the Association of Government PDM Technical Team. The Division of Emergency Services recommended a planning process to the AOG Technical Team containing the following steps.

The planning process included the following steps:

1. Resource Organization
2. Public Officials Outreach
3. Establish Continuity in Planning Process
4. Data Acquisition
5. Hazard Risk Identification and Analysis
6. County Vulnerability Assessment
7. Community Goals Assessment
8. Formation of County Mitigation Steering Committee
9. Mitigation Strategy Development
10. Prioritization of Identified Mitigation Strategies
11. State Plan Review
12. Adoption

State Natural Hazard Mitigation Planning Process

Since, the state plan is so integrated with the planning effort at the local level many similarities exist in the steps following. Many of the steps taken during the state planning process were done in support of local plans. Difficulty exists in attempting to describe a planning process, which took over two years to complete, into simple steps. With so many different entities and individuals' involved steps begin to congeal into a fluid step-less process. Nonetheless the three basic steps in the state planning process were:

1. Determine Need and Overall State PDM Planning Process
2. State Support for Multi-Jurisdictional Mitigation Plans
3. Development of State Hazard Mitigation Plan

1. DETERMINE NEED AND OVERALL STATE PDM PLANNING PROCESS

At the onset of most planning processes a need to complete or initiate planning must be determined. Changes were made in to the Stafford Act with the passage of the Disaster Mitigation Act of 2000. These changes resulted in states having to complete a mitigation plans as a contingent of receiving pre and post disaster federal assistance. The most recent State Hazard Mitigation Plan which, represented the latest in a series of plans, was written to conform to section 409 in the Stafford Act. This plan was compared with the new DMA 2000 Section 322 requirements. The comparison results along with the fact the plan had not been officially updated since 1999 resulted in a need to complete a new plan.

Form the Utah Pre-Disaster Mitigation Planning Committee (UPDMPC)

The state natural hazard mitigation planner formed the Utah Pre-Disaster Mitigation Planning Committee to serve as the core PDM planning body within the state. This planning team was tasked with providing technical assistance to the seven AOG, reviewing multi-jurisdictional plans, writing the state mitigation plan, coordinating with state agencies, and representing DES on various committees and commissions related to mitigation. The UPDMPC was comprised of:

Judy Watanabe	State Floodplain Manager
Nancy Barr	State Hazard Mitigation Officer
Bob Carey	State Earthquake Program Manager
Ryan Pietramali	State Natural Hazard Mitigation Planner
Jim Brown	Operations and Natural Hazard Section Manager

Assess Planning Capabilities

How the state was going to complete a state mitigation plan and administer a program, which ensured successful mitigation planning at the local level in a post 9/11 environment was problematic at best. The new emphasis on homeland security and the grants and programs offered by various federal agencies, was proving taxing on county and city emergency program managers. Typically, emergency managers would have been funded to complete county mitigation plans, as mitigation is one of the core functions of emergency managers and the four-phase approach to providing citizen safety.

The new requirements placed an emphasis on assessing risk and vulnerability at the local level.

The higher level of detail required in the local plans had not been completed in the state prior to the DMA 2000 requirement. It was determined assessing risk and determining vulnerability could only be carried out through use of Geographic Information Systems GIS. Fortunately, Utah has an abundance of natural hazard GIS base layers, with the exception of flood plains, to use in the analysis. It was determined the counties did not have the resources to complete mitigation plans for the level of funding, available to them.

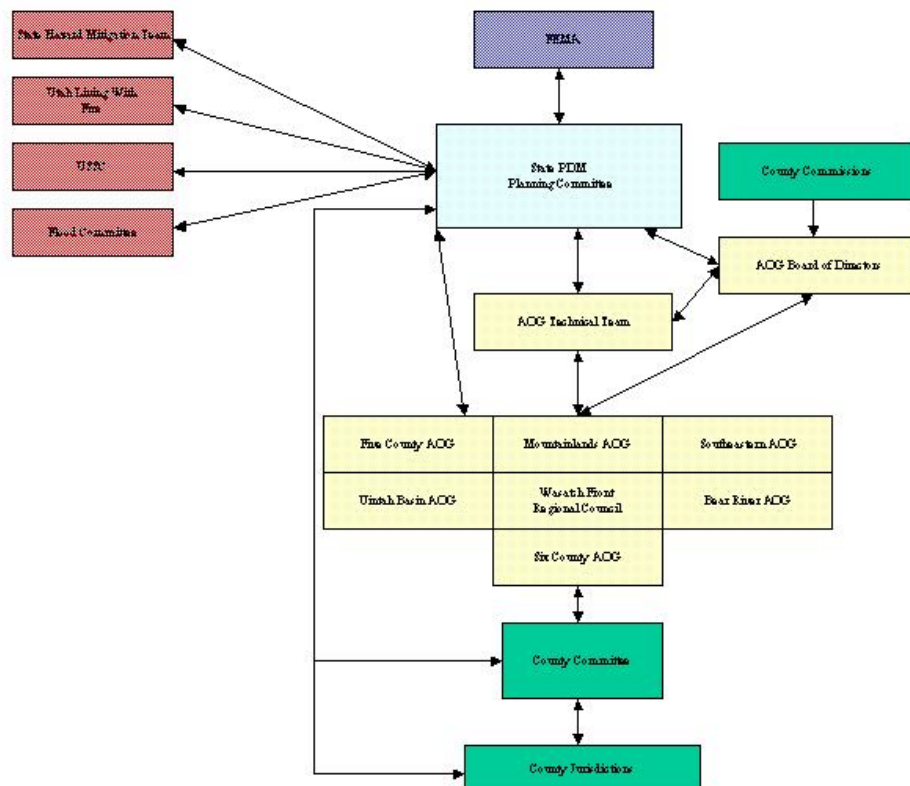
The state has a number of agencies with proficiency in natural hazards and natural hazard mitigation, the Utah Geologic Survey, Dam Safety, Water Resources, and Forestry, Fire, and State Lands to name a few. These agencies were willing to provide input on mitigation plans but did not have the resources to aid all 29 counties and 265 cities.

Contract Seven Associations of Government

It was determined following the analysis of state and local capabilities to meet the DMA 2000 requirements that; the state needed:

1. Planning entity with a dedicated planner,
2. GIS analyst,
3. Experience dealing with the elected officials on a more local level.

It was determined with assistance from the State Office of Planning and Budget that the seven



Associations of Government meet the requirements DES was looking for.

The initial 2002-planning grant, received by the State, from FEMA was utilized to contract with the seven associations of government. Contracts were put in place to complete natural hazard mitigation plans for those jurisdictions represent by each AOG.

2. STATE SUPPORT FOR MULTI-JURISDICTIONAL MITIGATION PLANNING

Coordination With Associations of Government

To ensure the AOGs were completing plans, containing the elements, which meet the DMA 2000 requirements and at the same time were useful for local governments. Enormous amounts of coordination took place between DES and the seven AOGs. This coordination included participation at Association of Governments Board of Directors meetings, involvement in local jurisdictions when meeting with the AOGs, training, data acquisition, presentations at elected officials meetings in support of PDM, and chairing the PDM Technical Team. The completed plans prove the close working relationship was beneficial.

Supporting Association of Governments Planning

Data and Information

A considerable amount of information was gathered at the onset and thought out the mitigation planning process. This information was disseminated to the seven Associations of Government and county governments. Information includes:

- GIS data on fault locations, fault zones, wildfire risk, flooding, dam location and hazard rating, landslide and debris flow location, business data, and critical facilities.
- Flood Insurance Rate Maps and Flood Insurance Studies
- History of past disaster occurrences
- Studies and technical reports

Development of Loss Estimation Methodology

Loss estimates in each AOG plan, were the result of methodology developed by the AOG technical team in conjunction with DES. Methodology used to ascertain loss in each multi-jurisdictional plan differs slightly. This difference is due in part to differences in data, data quality, and data availability.

Provide Subject Matter Experts

Upon request UPDMPC provided or coordinated technical experts to assist in developing both local mitigation strategies and multi-jurisdictional plans. These experts were primarily part of the State Hazard Mitigation Team with technical expertises in the following areas:

- Mitigation
- Geology

- Meteorology
- Engineering
- Climate
- Water Resource Management
- Wildfire
- Dam Safety
- Flood Plain Management

Multi-Jurisdictional Plan Review

Mitigation plans submitted by each AOG were formally reviewed three times (October 15, 2003, January 1, 2004, and February 1, 2004). These reviews were conducted by the UPDMPC with each member reviewing and commenting on the plan. Plans were reviewed against the FEMA crosswalk. Additional plan reviews were completed at the request of either the AOG or county with several reviews taking place per AOG. To prevent slowing the planning process and meet timelines, plans were returned to the AOG within 15 calendar days.

Public Officials Outreach

Completed local mitigation plan must be approved and promulgated by the jurisdictions. Understanding this could be problematic the members of the Utah Pre-Disaster Mitigation Planning Committee made numerous presentations to elected officials and jurisdiction representatives at the City and County Directors meetings, the League of Cities and Towns meeting, and various other elected officials meetings. The planning committee also designed presentations and encouraged each AOG to present to elected officials in their planning district. This brought on board those with the final responsibility of approving the plan at the bringing of the planning process.

Mitigation Training

Mitigation, and the concept of mitigation is an area of emergency management neglected at the state level for some time. While most county emergency managers had a general understanding of mitigation most still benefited from a refresher on new techniques and programs.

The seven AOGs had planning and GIS staff, who had never been exposed to mitigation or characteristics of natural hazards. Training was conducted on May 15 and 16, 2002 in Salt Lake City for the AOG. Training conducted by UPDMPC members at each association followed up this training.

Additional mitigation training was made available statewide on October 15, 2003 and on November 17-19 2003. These training were both well attended by AOG planning staff and county emergency managers.

3. DEVELOPMENT OF STATE HAZARD MITIGATION PLAN

Coordination With State Hazard Mitigation Team

The State Hazard Mitigation Team (SHMT), formally the Interagency Technical Team, has and will continue to be the cornerstone of any mitigation plan or project within the state of Utah. The SHMT is comprised of technical experts, representing numerous state and federal agencies. The UPDMPC worked directly with the numerous subject matter experts on the SHMT during completion of this mitigation plan.

Coordination Among State and Federal Agencies

The UPDMPC served as the single point of contact for most state and federal agencies resources utilized in the pre-disaster mitigation planning process. During the planning process, subject matter experts, from state and federal agencies, were used to verify information in the review of multi-jurisdiction mitigation plans submitted by the association of government. State and federal resources pertaining to mitigation are typically part of one of three committees: SHMT, USSC, or ULWF.

Complete State Natural Hazard Mitigation Plan

Following an extensive process and twenty-four months of local, regional, and state planning the UPDMPC began writing the state mitigation plan. This planning began following the final review of the seven multi-jurisdictional plans. Information from these plans was instrumental in completing the state plan.

Sections were split from the state mitigation plan for review. Each member of the SHMT reviewed sections of the plan pertinent to their field of expertise. Additionally the plan was put on the DES website and comments were solicited from interested parties.

Integration With Existing Plans

Several planning efforts, some similarly initiated by Department of Homeland Security, were taking place simultaneously to the PDM process. These planning initiatives include planning for the Flood Map Modernization Program, The Office of Domestic Preparedness, County updates of their Emergency Preparedness Plans to include Terrorism Annexes, and Envision Utah Program planning programs. These planning programs are further discussed, in subsequent sections of this plan. Every attempt was made to coordinate these planning efforts to reduce duplication of effort.

Comment Period

Following the completion of the State Hazard Mitigation Plan the plan was placed on the DES website. This web address was emailed to stake holders for plan comments.

A draft pre-disaster mitigation plan was submitted to FEMA region VIII in May of 2004. Following the draft submittal the state adjusted the plan based on FEMA comments and resubmitted the plan in August of 2004 for final approval. Between draft and final approval the state plan was put out for a 30-day comment period via the Internet, this web link was put in the legal notice section of several major newspapers requesting comment. Readers were allowed to submit comments for 30 days. Received comments can be found in Appendix A

Coordination Among State Agencies

The mitigation planning process should include coordination with other State agencies, appropriate Federal agencies, and interested groups.

The Utah Pre-Disaster Mitigation Committee (UPDMC) coordinated the development of the State Natural Hazard Mitigation Plan with other state, federal, and local agencies. Coordination among state and federal agencies involved in the planning process was primarily concentrated into six organizations or planning councils with members representing virtually all state, federal, and local agencies with responsibility related to natural hazards. These five principle agencies are: the State Hazard Mitigation Team, Utah Seismic Safety Commission, Associations of Governments, Utah Living With Fire Committee, City and County Emergency Managers, and State Floodplain Management Committee.

Description of Participating Agencies

State Hazard Mitigation Team

The Utah State Hazard Mitigation Team (SHMT) consists of representatives from State and Federal agencies, local agencies, and professional organizations. Individuals are subject matter experts in fields related to hazard mitigation. The Team includes geologists, hydrologist, meteorologists, engineers, and biologists to name a few. The primary role of the SHMT is to:

- Provide pre and post hazard mitigation information and technical assistance to local governments and individuals.
- Identify specific mitigation measures and assist in their implementation.
- Assist in evaluation and review of existing hazard mitigation plans.

The State Hazard Mitigation Team consists of the following principal individuals with additional experts available if requested.

Table I-2 State Hazard Mitigation Team Members

Name	Agency Representing
Gary Christenson	Utah Geologic Survey
Richard Giraud	Utah Geologic Survey
Francis Ashland	Utah Geologic Survey
Kevin Barjenbruch	National Weather Service
Brian McInerney	National Weather Service
Dave Dalrymple	State Forestry, Fire, and State Lands
Tracy Dunford	State Forestry, Fire, and State Lands
Scott Stoddard	U.S. Army Corps of Engineers
Robert Rasely	NRCS
Randy Julander	NRCS
Al Jones	Department of Environmental Quality
John Oakeson	Department of Environmental Quality
Kim Dykes	Department of Environmental Quality
Jim McMinimee	Utah Department of Transportation

Darren Rasmussen	Department of Natural Resources
Ken Short	Department of Natural Resources
Bill Bradwisch	Department of Natural Resources
Matt Lindon	Department of Natural Resources
Kyle Stephens	Utah Department of Agriculture
Ryan Pietramali	Utah Division of Emergency Services
Judy Watanabe	Utah Division of Emergency Services
Nancy Barr	Utah Division of Emergency Services
Bob Carey	Utah Division of Emergency Services
Paul Lambert	U.S. Geologic Survey

The SHMT meet on the following dates during the planning process:

- December 12, 2002
- April 1, 2003
- July 8, 2003
- October 28, 2003
- February 3, 2004
- May 4, 2004
- August 5, 2004
- November 2, 2004

Utah Seismic Safety Commission

The Utah Seismic Safety Commission USSC was established with the passage of House Bill 358, during the 1994 legislative session. The USSC committee primarily advises the Governor, Utah Legislature, state and local government agencies, and the private sector on issues related to earthquake safety.

The objective of USSC is to:

- Review earthquake-related hazards and risk in Utah,
- Prioritize recommendations to identify and mitigate these hazards and risks,
- Prioritize recommendations for adoption as policy or loss reduction strategies,
- Act as a source of information for earthquake safety and promote loss reduction measures,
- Prepare a strategic seismic safety planning document, and
- Update the strategic-planning document and other supporting studies or reports.

The USSC has compiled a report outlining a long-term plan to improve earthquake safety in the state of Utah entitled “A Strategic Plan for Earthquake Safety in Utah.” The plan lists 33 specific strategies grouped into five key objectives and are outlined in a 64-page report found in Appendix C. Table I-3 lists the agencies, organizations, and private businesses represented on the USSC.

Table I-3 Utah Seismic Safety Commission Members

Name	Organization Represented
Chair Barry H. Welliver	Structural Engineers Association
Rick Allis	Utah Geologic Survey
Walter J. Arabasz	University of Utah Seismograph

	Stations
Hagop Jake Arslanian	American Public Works Association
Kerry Baum	Associations of Contingency Planners
Doug Bausch	FEMA
Nannette Rolfe	Utah Division of Emergency Services
Representative Don Bush	Utah House of Representatives
Catherine Howick	Utah Insurance Department, Property & Casualty Division
Michael Keene	State Science Advisor
Senator Peter C. Knudson	Utah State Senate
Peter W. McDonough	American Society of Civil Engineers
Matthias Mueller	Utah Division of Facilities Construction
David Nazare	Utah Department of Transportation
Barry Smith	American Institute of Architects
Mark Peterson	U.S. Geologic Survey
Carl Eriksson	Utah League of Cities and Towns

Bob Carey, represents the Utah Pre-Disaster Mitigation Planning Committee on the Utah Seismic Safety Commission. USSC conducted meetings on the following days during the PDM planning process:

- October 25, 2002
- January 17, 2003
- April 11, 2003
- July 18, 2003
- October 24, 2003
- January 16, 2004
- April 2, 2004
- July 9, 2004
- October 22, 2004

Associations of Governments

Associations of Governments AOG, implement the vision of multi-county or regional planning districts to coordinate planning and governmental activities within a specified geographic area of the state. These multi-county planning districts, or Associations of Governments (AOG), encompass and combine three or more counties with the primary concern to provide a framework to aid and encourage better coordination of and communication between plans and programs and to facilitate more efficient and effective ways for the administration and delivery of services that will carry out the responsibilities of government. . . (and) provide and operate various types of services or to develop facilities that would be more efficient on a district basis. Thus, regional planning districts have a few distinct purposes:

- Regional (and state-wide) planning and integration,

- Reduce duplication of local government efforts,
- Economies of scale.

With these distinct advantages, regional planning districts appeared the obvious solution to the rising difficulties of government activities in the middle 1960s when they were started and again when the state was faced with meeting the task of regional mitigation planning. In fact, Utah took to this concept almost out of necessity.

Table I-4 Associations of Government Board of Directors

Name	Association of Governments
John Williams	Five County Association of Governments
Bill Howell	Southeastern Association of Governments
Roger Jones	Bear River Association of Governments
Laurie Brummond	Uintah Basin Association of Governments
Russell Cowley	Six County Association of Governments
Chuck Chappell	Wasatch Front Regional Council
Darrell Cook	Mountainland Association of Governments

Necessity

Several factors pushed Utah to consider regional planning districts, including, but not limited to, the following:

- Utah's rural county makeup--and its declining rural county population--enhanced the difficulty of providing effective state and federal programs.
- These local government entities also found it difficult to resolve and develop support services for the rising social and economic problems of modern society.
- Many state or federal programs encompassed boundaries broader than, and separate from, city and county lines, resulting in overlapping jurisdictions, duplication, and competition for resources (i.e. law enforcement and employment security).
- Various regional groups had been formed, but not in any organized fashion, increasing the difficulty of approving, funding, and administering government programs.

Creation

On the federal level, a presidential memorandum issued in 1966 recognized the problem and requested federal agencies to coordinate and establish the multi-jurisdictional planning units with boundaries congruous with state planning and development districts. Subsequently, circulars A-80 (1967) and A-95 (1969) were issued by the Bureau of the Budget encouraging the establishment of these state planning and development districts. The catalyst of circular A-95, the Intergovernmental Cooperation Act of 1968, requested the creation of mechanisms to evaluate and review federal programs that heavily influence local planning and development.

Utah Living With Fire Committee

The Utah Living With Fire Program is a statewide effort, designed by agencies and communities, committed to providing wildfire information and education to mobilize

citizens to establish and maintain wildfire defensible communities. The Utah Living with Fire Committee was formed to initiate and oversee the Utah Living With Fire Program. The committee includes members from city, county, state, and federal agencies responsible for wildfire suppression and education. Through this effort home owners living in wildland areas have been educated on the threat of wildland fire and mitigation measures they can take to help defend there property. The following agencies are represented on the ULWF committee: UFFSL, BLM, USFS, DES, State Fire Marshals Office, U of U, USU, Big Cottonwood Canyon Association, Salt Lake City, Salt Lake County, Utah County, and Davis County.

Utah Floodplain and Stormwater Management Association UFSMA

The Utah Floodplain and Stormwater Management Association, is an organization of professionals involved in floodplain management, stormwater management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness. UFSMA has become a respected voice in floodplain management practice in Utah because it represents the flood hazard specialists of local, state and federal government, the research community, the insurance industry, and the fields of engineering, hydrologic forecasting, emergency response, water resources, and others.

Each year UFSMA holds an annual conference on various floodplain and stormwater management issues. This conference is typically held in October. The conference is moved around to different parts of the state to incorporate more individuals into our association and to discuss different issues for the different regions. We also conduct roundtable discussions on specific topics. These roundtables in the past have been on the map revision process, stormwater management guidelines, and local stormwater management programs. They are offered throughout the year, usually in the summer.

The purposes of the Utah Floodplain and Stormwater Management Association are:

- To educate those involved in floodplain and / or stormwater management about the regulations governing their programs and keep them in compliance with those regulations.
- To encourage communities involved in the Stormwater Phase II to be aware of upcoming deadlines and assist them in implementing their stormwater management programs.
- To promote flood awareness and encourage wise use and management of floodplains.
- To educate locals on new techniques and innovative and improved measures for floodplain management.

Table I-5 Utah Floodplain and Stormwater Management Association Board of Directors

Name	Organization Represented
Dr. George Burbidge, Chairman	Weber County Storm Water Management
Dave Adamson, Vice-Chair	Davis County Public Works

W.D. Robinson, Secretary	Department of Agriculture and Food, Development and Conservation Division
Judy Watanabe, Treasure	Utah Division of Emergency Services
Derrick Radke	Summit County Division of Engineering
Dr. William Rahmeyer	Water Research Lab, Utah State University
Ross Wilson	JUB Engineers
Scott Stoddard	Intermountain Representative, USACE
Dustin Lewis	Centerville City Public Works

City and County Emergency Managers

There are 144 designated City and County Emergency Managers in the state of Utah. The majority of these emergency managers are; volunteers, as a current City/County employee have this additional duty assigned to them, or are part time employees paid through a Federal grant. There are only five designated full time emergency managers in the state. These dedicated professionals ensure Utah can respond to, recover from, prepare for and mitigate for disasters in the state.

City and County Emergency Managers played a significant role in the mitigation planning process. Their knowledge of natural hazards in their communities allowed for the development of sound, realistic mitigation strategies, identified in the Regional plans. As emergency managers they are aware of the importance of planning principles and support efforts to ensure the Regional plans reflect their unique hazards and risks. Emergency Managers were instrumental in the formal adoption of the Regional mitigation plans.

Quarterly emergency manager's meetings are held to discuss current issues and update the emergency management community on ongoing natural, technological, and human event planning activities, grant opportunities, training, and other items related to their responsibilities as emergency managers. A yearly Public Officials Conference POC is also held to educate and inform elected officials and emergency managers of current emergency management issues and trends.

Integration With Ongoing Planning Efforts

The Standard State Plan must be integrated to the extent possible with other ongoing State planning efforts as well as other FEMA mitigation programs and initiatives.

National Fire Plan and Utah Forestry, Fire, and State Lands Community Fire Planning

The Utah Division of Forestry, Fire, and State Lands UFF&SL initiated Community Fire Planning for the wildland urban interface communities of Utah. Over 400 Utah communities have been classified as "at risk" to wildfire, in the National Fire Plan. To protect these communities; community fire planning was initiated to:

- Empower communities to organize, plan, and take action on issues impacting community safety.
- Enhance levels of fire resistance and protection to the community
- Identify the risks of wildland/urban interface fires in the area
- Identify strategies to reduce the risks to homes and business in the community during a wildfire.

Above all, the community plans, because of their grass roots organization and training have enforced the fact that wildfire is a local issue and the ownership of the problem resides at the local level.

The community wildfire plans in table I-6 were both supported and utilized in the creation of this mitigation plan and the multi-jurisdictional mitigation plans.

Table I-6 Community Fire Planning Completed and in Progress

Community Fire Plans Completed		
No.	Community	County
1.	Mt. Haven	Salt Lake
2.	Cardiff Fork	Salt Lake
3.	Mill D	Salt Lake
4.	Pinetree	Salt Lake
5.	Silver Fork	Salt Lake
6.	Evergreen	Salt Lake
7.	Giles Flat	Salt Lake
8.	Brighton	Salt Lake
9.	Summit Park	Summit
10.	Sundance	Utah
11.	Woodland Hills	Utah
12.	Central	Washington
13.	Dixie Deer	Washington
14.	Mt. Aire	Salt Lake
15.	Covered Bridge	Utah
16.	Fruitland	Duchesne
17.	Bandanna Ranch	Duchesne
18.	Tabby Shadows	Duchesne
19.	Sundowner Ridge	Duchesne
20.	Pinyon Ridge	Duchesne
21.	Young Ranch	Duchesne
22.	Coleman Mountain Ranch	Duchesne
23.	Clark Estate	Duchesne
24.	Lower Red Creek	Duchesne
25.	Manorlands	Summit
26.	Pinebrook	Summit
27.	Colony at White Pine Canyon	Summit
28.	Bridgerland	Rich
29.	Cedar Highlands	Iron
30.	Interlaken	Wasatch
31.	Eureka	Juab
32.	Mammoth	Juab
33.	Silver City	Juab
34.	Brian Head	Iron
35.	Duck Creek	Kane
36.	Skyline Mtn. Resort	Sanpete
37.	Canaan	Washington
38.	Hi-Low / Arrowhead	Beaver
39.	Quichipa	Iron
40.	Brookside	Washington
41.	Hideaway Valley	Sanpete

Community Fire Plans in Process		
No.	Community	County
1.	Bullion Canyon (BLM)	Piute
2.	Monroe/Manning Meadows (BLM)	Sevier/Piute
3.	SUU Mountain Center (BLM)	Iron
4.	East Zion (BLM)	Kane
5.	Vista Grande (BLM)	Rich
6.	Willow Glen	Sanpete
7.	Swiss Mountain	Wasatch
8.	Echo Creek	Summit
9.	Hobble Creek	Utah
10.	Diamond Hills	Wasatch
11.	Woodland Estate	Wasatch
12.	Pine Mountain	Summit
13.	Canyon Rim	Summit
14.	Hidden Lake	Summit
15.	Echo Creek Ranches	Summit
16.	Pine Meadows	Summit
17.	Dry Fork / Deep Creek	Uintah
18.	Taylors Flat (BLM)	Daggett
19.	Nordic Valley	Weber
20.	Springdell	Utah
21.	Uintah Highland	Weber
22.	Sourdough	Weber
23.	Causey Estate	Weber
24.	Birch Glen	Cache
25.	Scare Canyon	Cache
26.	Cedar Ridge	Cache
27.	Argyle (BLM)	Duchesne
28.	Gunlock (BLM)	Washington
29.	Enterprise (BLM)	Washington
30.	Veyo (BLM)	Washington
31.	Pine Valley	Washington
32.	Zion Ponderosa	Kane
33.	Big Water	Kane
34.	Hildale	Washington
35.	Torrey/Teasdale/Grover (BLM)	Wayne
36.	Rockport Area	Summit
37.	Winchester Hills (BLM)	Washington
38.	Rocky Ridge	Juab
39.	Eastland (BLM)	San Juan
40.	Shivwits Band of Piute (BLM)	Washington
41.	Holiday Park	

42.	Indian Ridge	Sanpete
43.	Blackhawk Estates	Sanpete
44.	Panorama Woods	Sanpete
45.	Fairview Ranchos	Sanpete
46.	Indianola	Sanpete
47.	Camp Kolob	Washington
48.	Bryce Woodlands	Kane
49.	Far West/Comstock/Diamond Z Ranch	Iron
50.	Mammoth Creek	Garfield
51.	Pine Creek Ranch	Sanpete
52.	Apple Valley	Washington
53.	Gooseberry	Washington
54.	Little Creek	Washington
55.	South Zion Estates	Washington
56.	Mountain Meadows	Washington
57.	Saratoga Springs (BLM)	Utah
58.	Forest Home at Lambs Canyon	Salt Lake
59.	Castle Valley (BLM)	Grand
60.	Hi-Country Estates	Salt Lake
61.	Joe's Valley	Emery
62.	Pack Creek	San Juan
63.	East Carbon/Columbia (BLM)	Carbon
64.	Wray Mesa/Old LaSal	San Juan
65.	Aspen Hills	Sanpete

42.	Hildale (BLM)	Washington
43.	Westwater (BLM)	Grand
44.	Clear Creek	Carbon
45.	Scofield	Carbon
46.	Monument Canyon (BLM)	San Juan
47.	Kenilworth (BLM)	Carbon
48.	Monticello (BLM)	San Juan
49.	Emigration Canyon	Salt Lake
50.	New Harmony (BLM)	Washington
51.	Eagle Mountain (BLM)	Utah
52.	Cedar Fort (BLM)	Utah
53.	Grantsville (BLM)	Tooele
54.	Comstock Corridor (BLM)	Iron
55.	Iron Town (BLM)	Iron
56.	Timberlakes	Wasatch
57.	Samak	Wasatch
58.	Diamond Mtn. (BLM)	Uintah
59.	Uintalands	Summit

Office of Domestic Preparedness Assessment

The Office of Domestic Preparedness assessment is designed to give the state a comprehensive planning document that includes all needs for a WMD response to a terrorism incident. This planning is in its infancy, yet DES is working to coordinate ODP planning and assessment results with the State Hazard Mitigation plan. There is the potential for future mitigation plans to include risk assessments and dollar values for both natural and man made hazard events. GIS analysis has begun, comparing data compiled during the ODP assessment with data compiled during the PDM planning process; the end product should provide an understanding of total risk.

Floodplain Management

Within Utah's floodplain management program one of the top priorities has been and will continue to be updating current floodplain maps and mapping those areas of the state yet to be mapped. This effort is directly integrated into the PDM planning process. Through coordination with local governments, during the completion of the multi-jurisdictional PDM plans, the age of floodplain maps along with their inaccuracy was a consistent concern raised at the local level. This is evident in the mitigation recommendations put forward in the local mitigation plans.

To address this problem the Utah Floodplain Manager has completed the 'Map Modernization Program Business Case Plan' specifying how the state will implement and administer the map modernization program, if funded; and "The Utah Mapping Priority Assessment" which mathematically prioritizes map modernization funding based on need. Both plans are available for reviewed in Appendix D and E.

County Emergency Operations Plans

Mitigation, one of the four phases of emergency management is included in most city and county emergency operations plans EOP. These plans detail how local governments will

respond to events. These plans include information on vulnerability, potential dollar losses, and likelihood of natural events; all products of the multi-jurisdictional PDM plan. Incorporating PDM data is aiding locals in developing and updating their county and city EOP. Understanding the cost of infrastructure within a given jurisdiction regardless of how it was damaged is assisting locals in developing exercises based on real world estimates.

Terrorism Annex

Following the events that took place on September 11, a new emphasis was placed on terrorism. To address this threat most jurisdictions have begun working on terrorism annexes to their EOP. Many of the teams and committees joined together during the PDM planning process are being utilized to complete the terrorism annexes.

Emergency Management Accreditation Program

The Emergency Management Accreditation Program or EMAP is a voluntary review process for state and local emergency management programs. Accreditation is a means of demonstrating, through self-assessment, documentation and peer review, that a program meets national standards for emergency management programs.

EMAP was created by a group of national organizations to foster continuous improvement in emergency management capabilities. It provides emergency management programs the opportunity to be recognized for compliance with national standards, to demonstrate accountability, and to focus attention on areas and issues where resources are needed.

It has been suggested that Utah go through the EMAP base line assessment prior to 2005. Getting ready for the accreditation process forced coordination with planning done by DES and several other divisions and bureaus within the Department of Public Safety. Members of the Utah Pre-Disaster Mitigation Planning team are also working with the State EMAP accreditation team.

Envision Utah

In January 1997, Envision Utah a Public/Private Partnership was formed to guide the development of a broadly and publicly supported Quality Growth Strategy - a vision to protect Utah's environment, economic strength, and quality of life for generations to come. Five years of scenarios analysis, research and public involvement have helped Envision Utah bring the topic of planning and preparing for growth to the forefront of the public mind. With the help of thousands of Utah residents, Envision Utah has developed a Quality Growth Strategy which will help preserve critical lands, promote water conservation and clean air, improve our region-wide transportation systems, and provide housing options for all residents.

Envision Utah's goal throughout the process has been to involve key decision-makers and the community to gain support at the ground level. Building grass roots support for the project will ensure successful implementation. The Envision Utah effort has included research concerning core values of Utah residents, workshops with key stakeholders to

address where and how to grow, and extensive public awareness and education efforts asking Utah residents to express their preferences for their communities' future. The Governor's Office of Planning and Budget coordinates a technical committee, Quality Growth Efficiency Tools (QGET) that provided critical technical information to help analyze the impacts of growth on transportation, air quality, land use, water supply/demand, and infrastructure costs. Through the exhaustive involvement of the public, local and state elected officials, the business, civic, and religious communities, and other key stakeholders, Envision Utah has gathered information about what Greater Wasatch Area residents value and how they think growth should be accommodated. Based on this information, Envision Utah identified six primary goals that need to be addressed in the Greater Wasatch Area if we are to protect our environment and maintain our economic vitality and quality of life as we accommodate anticipated growth:

- enhance air quality;
- Increase mobility and transportation choices;
- Preserve critical lands, including agricultural, sensitive and strategic open lands;
- Conserve and maintain availability of water resources;
- Provide housing opportunities for a range of family and income types; and
- Maximize efficiency in public and infrastructure investments to promote other goals.

These goals can be realized over time by the careful and deliberate pursuit of the thirty-two individual strategies identified by Envision Utah in the Quality Growth Strategy. These strategies rely on citizen involvement with local officials, local land-use decision-making and more awareness of free market needs in housing choices. Cooperation at the regional level, state incentives to local governments and local government incentives to developers will also be necessary to address issues such as air quality, water conservation, housing opportunities, transportation, and critical lands.

Envision Utah has developed model codes and development standards for quality growth, including for environmentally sensitive areas such as:

- Floodplain corridor lands
- Riparian preserve lands
- Erosive and slope failure lands
- Wildfire lands

Additional Plans and Programs relate to the State Hazard Mitigation Plan

In addition to the planning efforts discussed above, this Natural Hazard Mitigation Plan incorporates by reference the following plans and/or programs developed by state or federal agencies. Mitigation programs, priorities, and initiatives described within these plans, should be conformed to, supported, and incorporated into mitigation planning done by local jurisdictions and state agencies.

National Fire Plan, USFS

Reference: www.fireplan.gov

Dam Safety Section

Utah Dam Safety Guide to Routine Maintenance of Dams 2003

Reference: http://www.waterrights.utah.gov/daminfo/maint_guide.pdf

Utah Dam Safety Guide to Emergency Action Plans Development and Implementation
2003

Reference: <http://www.waterrights.utah.gov/daminfo/eap.pdf>

Utah Drought Response Plan, Utah Natural Resources Water Resources, March 1993

Reference: <http://www.drought.unl.edu/ndmc/plan/state%20plans/Utah.pdf>

Utah's M&I Water Conservation Plan, State of Utah Natural Resources Division of
Water Resources

Reference: <http://www.conservewater.utah.gov/WCPlan/Plan7-14-03.pdf>

Utah State Water Plan, State of Utah Natural Resources Division of Water Resources

Reference: www.water.utah.gov/waterplan

A Strategic Plan for Earthquake Safety in Utah, 1995 Utah Seismic Safety Commission

Reference: http://www.barrywelliver.com/html/plan_1994.html

Earthquake Safety in Utah "A Progress Report on Activities for the Period July 1994-
June 1996" Utah Seismic Safety Commission

Reference: http://www.barrywelliver.com/html/plan_1996.html

Earthquake Safety in Utah "A Progress Report on Activities and Accomplishments of the
Utah Seismic Safety Commission for the Period July 1, 1996 to June 30, 2000" Utah
Seismic Safety Commission

Reference: http://www.barrywelliver.com/html/plan_2000.html

Utah Forest Health Report A Baseline Assessment 1999-2001. Department of Natural
Resources Division of Forestry, Fire, and State Lands.

Reference: <http://www.ffsl.utah.gov/utfor-lr.pdf>

Integration with FEMA Programs and Initiatives

FEMA is the backbone of natural hazard mitigation with FEMA programs driving mitigation nation wide. FEMA initiated mitigation planning and has administered funding for the new PDM planning requirement for which this plan was prepared for. It is difficult if not impossible, not to fully integrate FEMA mitigation programs into mitigation planning. What follows is a description of several major FEMA programs integrated into this mitigation plan.

Pre-Disaster Mitigation

Pre-Disaster Mitigation or PDM is a Federal program administered by FEMA, which initially funded local and state mitigation planning being completed to meet the requirements of DMA 2000. Over two years the state of Utah received slightly under \$500,000 dollars to facilitate PDM planning. With this funding as discussed previously

the State funding local mitigation planning through the seven associations of government and conducted training on mitigation planning.

Pre-Disaster Mitigation Planning Competitive

This federal grant program is a competitive program administered by FEMA, a first for this federal agency. Grant applications are forwarded to a national review panel where they compete against one another for funding. Competition is based benefit to cost, feasibility, mitigation merit, etc.

In 2004 the state of Utah was awarded a grant through the competitive program to seismically retrofit the University of Utah's Marriott Library. This is a vital building in the states inventory one it's content is of incredible value and two the large life safety risk associated with the collapse of this building.

The state will look to the PDM-C program to complete many of the mitigation strategies described within the pages of this plan.

Flood Map Modernization

Utah has always been a great supporter of FEMA's flood mapping efforts. Utah's maps are some of the oldest in the country, yet we are the 4th fastest growing state. The need for new and accurate mapping is evident.

The following programs support flood mapping the State: State Community Assistance Program (CAP), State Map Modernization Management Support Program (MMMS), and the State Hazard Mitigation Program. The State Hazard Mitigation Program supports and assist in all hazard mitigation programs within the State.

Three plans have been developed and supported by FEMA in State's efforts to implement and fund flood mapping. These plans are: Utah's Flood Map Modernization Implementation Plan, Utah's Flood Mapping Business Case Plan, and the Five-Year Strategic Plan for that addresses both flood mapping and the CAP.

Through the current Flood Map Modernization Program the State has received an FY 04 funding amount of approximately \$600,000 to fund flood mapping for Davis and Cache Counties. FY 05 funding levels are not yet available. We have also received funding for a Mapping Coordinator through the MMMS Program for FY04. The State anticipates the Federal funding level will remain consistent as we continue to support the updating of the State's floodplain maps.

National Repetitive Loss Program

The floods of 1983 and 1984 proved to be more than just significant flood events. With damages over \$500 million, and flooding in virtually every county in the state, these events forced Utah to mitigate flood hazards so that this type of flooding would never happen again.

The 2 million Utah inhabitants are clustered in relatively small geographic areas at the base of steep mountain ranges, with 90 percent of the population concentrated in the Wasatch Front region. Major floods in Utah are almost always the result of rapidly melting snow in late spring and early summer, often intensified by accompanying rain. The snowmelt, combined with precipitation and climate patterns, also impacts the eventual level of the Great Salt Lake, which has no outlet and is thus controlled solely by evaporation.

The flood events of 1983 and 1984 are when Utah has had its most repetitive losses. Fortunately, the state and local communities have mitigated many of the problems that caused this flooding. Pictures from the 1983 flood shows State Street in downtown Salt Lake as a river. This flooding was caused by too small of culverts clogged by debris in City Creek Canyon. Since then, larger culverts have been installed and a stormwater management plans and regulations keep the channels free from debris on a regular basis. The Great Salt Lake flooding was a major problem in the 80's. A closed basin lake posed a dilemma of what to do with the excess water. Huge pumps were installed in 1985 to pump thousands of cubic feet of water from the Great Salt Lake to the west desert to prevent flooding. These kind of stories are popular throughout the state where mitigation has occurred to reduce Utah's flooding and eliminate repetitive losses.

The following report shows that 95% of all of the Utah repetitive losses listed in the report, have been mitigated through channel modification, regular channel maintenance, or structure removal.

National Earthquake Hazard Reduction Program NEHRP

In October 1977, Congress passed the Earthquake Hazards Reduction Act to “reduce the risks life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards reduction program. NEHRP is supported by:

- FEMA
- National Institute of Standards and Technology
- National Science Foundation
- United States Geologic Survey

With four basic goals:

- Promote understanding of earthquakes and their effects
- Work to better identify earthquake risk
- Improve earthquake-resistant design and construction techniques
- Encourage the use of earthquake-safe policies and planning practices

NEHRP and the four goals have been integrated throughout the development of this plan.

HAZUS MH

HAZUS-MH, is a nationally applicable standardized methodology and software program, which contains models for estimating potential losses from earthquakes, floods, and hurricane winds. HAZUS-MH was developed by the Federal Emergency Management Agency (FEMA) under contract with the National Institute of Building Sciences (NIBS).

NIBS maintains committees of wind, flood, earthquake and software experts to provide technical oversight and guidance to HAZUS-MH development. Loss estimates produced by HAZUS-MH are based on current scientific and engineering knowledge of the effects of hurricane winds, floods, and earthquakes. Estimating losses is essential to decision-making at all levels of government, providing a basis for developing mitigation plans and policies, emergency preparedness, and response and recovery planning.

HAZUS-MH uses state-of-the-art geographic information system (GIS) software to map and display hazard data and the results of damage and economic loss estimates for buildings and infrastructure. It also allows users to estimate the impacts of hurricane winds, floods, and earthquakes on populations.

HAZUS MH was utilized to produce damage loss estimates extensively in this state mitigation plan as well as multi-jurisdictional mitigation plans developed by the seven AOG. In some instances where the model was not fully utilized the loss methodology used by HAZUS or its data was.

State Background

Climate

Topographic Features

The topography of Utah is extremely varied, with most of the State being mountainous. A series of mountains (including the Wasatch Range), which runs generally north and south through the middle of Utah, and the Uinta Mountains, which extend east and west through the northeast portion, are the principal ranges. Crest lines of these mountains are mostly above 10,000 feet. Less extensive ranges are scattered over the remainder of the State. The lowest area is the Virgin River Valley in the southwestern part with elevations between 2,500 and 3,500 feet, while the highest point is Kings Peak in the Uinta Mountains, which rises to 13,498 feet.

The Colorado River and its principal tributary within the State, the Green River, drain practically all of eastern Utah although neither rises within its borders. Western Utah is almost entirely within the Great Basin, with no outlet to the sea. The largest rivers in this area are the Bear, Weber, Jordan, Provo, and Sevier, the first three of which empty into Great Salt Lake, The Sevier River drains the west-central area and empties into Sevier Lake, a brackish saline basin in southwest Utah.

The main streams in the eastern portion of the State flow through canyons or very narrow, confined mountain valleys and finally into desert canyons. Some meadows, usually in native grass, and only a few small local areas of farmland are subject to overflow. Nearly all the main highways and railroads, as well as residential areas, are above flood levels. Highest flow occurs in the streams in this region in May and June during spring runoff from melting snow.

The most serious floods in Utah have occurred in the Great Lake Basin, particularly in the Weber River drainage on the western slopes of the Wasatch Mountains. During the

past 100 years approximately 300 flash floods, resulting from high intensity rainfall accompanying thunderstorms, and 135 snowmelt floods, have been recorded. Some have been very limited in area and extent of damage, while others have been highly destructive in cities, towns and agricultural areas. However, severe floods are not likely to occur in any given locality more than once in several years, or even several decades.

Great Salt Lake, in northwestern Utah, lies in the Great Basin, the largest closed basin in North America. Part of this drainage area is below 4,500 feet in elevation, with the Lake being about 4,200 feet. Great Salt Lake is the largest lake at this elevation (or higher) in the world. In glacial times it was a fresh water lake occupying an area 346 miles long and 145 miles wide; but due to increased evaporation and/or reduced precipitation, it gradually shrank in size and the salinity increased. Since this large body of water now has no drainage outlet, the salt content is high, averaging about 25 percent. Thus, the Lake, which never freezes over, provides a moderating effect throughout the year on temperatures in the immediate vicinity.

General Climatic Features

Essentially, Utah's climate is determined by its distance from the equator; its elevation above sea level; the location of the State with respect to the average storm paths over the Intermountain Region; and its distance from the principal moisture sources of the area, namely, the Pacific Ocean and the Gulf of Mexico. Also, the mountain ranges over the western United States, particularly the Sierra Nevada and Cascade Ranges and the Rocky Mountains, have a marked influence on the climate of the State. Pacific storms, before reaching Utah, must first cross the Sierras or Cascades. As the moist air is forced to rise over these high mountains, a large portion of the original moisture falls as precipitation. Thus, the prevailing westerly air currents reaching Utah are comparatively dry, resulting in light precipitation over most of the State.

Temperature

There are definite variations in temperature with altitude and with latitude. Naturally, the mountains and the elevated valleys have the cooler climates, with the lower areas of the State having the higher temperatures. There is about a 3° F decrease in mean annual temperature for each 1,000-foot increase in altitude, and approximately 1.5 to 2° F decrease in average yearly temperature for each one degree increase in latitude. Thus, weather stations in the southern counties generally have average annual temperatures 6 to 8 degrees higher than those at similar altitudes over the northern counties.

Temperatures below zero during winter and early spring are uncommon in most areas of the State, and prolonged periods of extremely cold weather are rare. This is primarily due to the mountains east and north of the State, which act as a barrier to intensely cold continental Arctic air masses. The lowest temperature of record is 50° F below zero.

Utah experiences relatively strong insulation during the day and rapid nocturnal cooling, resulting in wide daily ranges in temperature. Even after the hottest days, nights are usually cool over the State.

On clear nights the colder air accumulates, by drainage, on the valley bottoms, while the foothills and bench areas remain relatively warm. For this reason, the higher lands at the edges of the valleys are devoted ordinarily to the more valuable and delicate fruits, berries, and vegetables, while the hardier grains and vegetables are planted in the bottom lands.

Owing to the varied topography of the State, there are no orderly or extensive zones of equal length of growing season between the last freeze in spring and the first in fall. There are, however, from 4 ½ to 5 months of freeze-free growing weather in the State's principal agricultural areas. A difference of two weeks in the growing season is often noted in the same valley between the bottomlands and the adjacent farming lands at the foot of the mountains.

Precipitation

Precipitation varies greatly, from an average of less than five inches annually over the Great Salt Lake Desert (west of Great Salt Lake), to more than 40 inches in some parts of the Wasatch Mountains. The average annual precipitation in the leading agricultural areas is between 10 to 15 inches, necessitating irrigation for the economic production of most crops. However, the mountains, where winter snows form the chief reservoirs of moisture, are conveniently adjacent to practically all farming areas, and there is usually sufficient water for most land under irrigation. The areas of the State below an elevation of 4,000 feet, all in the southern part, generally receive less than 10 inches of moisture annually.

Northwestern Utah, over and along the mountains, receives appreciably more precipitation in a year than is received at similar elevations over the rest of the State, primarily due to terrain and the direction of normal storm tracks. The bulk of the moisture falling over that area can be attributed to the movement of Pacific storms through the region during the winter and spring months. In summer northwestern Utah is comparatively dry. The eastern portion receives appreciable rain from summer thunderstorms, which are usually associated with moisture-laden air masses from the Gulf of Mexico.

Snowfall is moderately heavy in the mountains, especially over the northern part. This is conducive to a large amount of winter sports activity, including skiing and hunting. While the principal population centers along the base of the mountains receive more snow, as a rule, than many middle and northeastern sections of the United States, a deep snow cover seldom remains long on the ground.

Runoff from melting mountain snow usually reaches a peak in April, May or early June, and sometimes causes flooding along the lower streams. However, damaging floods of this kind are infrequent. Flash floods from summer thunderstorms are more frequent, but they affect only small, local areas.

Other Climatic Features

Sunny skies prevail most of the year in Utah. There is an average of about 65 to 75 percent of the possible amount of sunshine at Salt Lake City during spring, summer, and fall. In winter Salt Lake City has about 50 percent of the possible sunshine.

During the late fall and winter months, anticyclones tend to settle over the great Basin for as long as several weeks at a time. Under these conditions, smoke and haze accumulate in the lower levels of the stagnant air over the valleys of northwestern Utah, frequently becoming an obstruction to visibility. This is also true of fog, which may persist for several weeks at a time.

Wind speeds are usually light to moderate, ranging below 20 miles per hour. There are only a few tornadoes in Utah as a rule, and those reported usually cause only slight damage. However, strong winds occur occasionally, sometimes attaining damaging proportions in local areas, particularly in the vicinity of the canyon mouths along the western slopes of the Wasatch Mountains. Dust storms occur occasionally, principally over western Utah. These storms are associated with the movement of low-pressure disturbances through the area during the spring months.

Hailstorms may damage fruit and vegetables in limited areas during spring and summer, although the hail is usually small.

Climate and Economy

Utah is not a large agricultural state, even through appreciable crops, livestock, and dairy products are produced within its boundaries. Only four percent of the land is under cultivation, but approximately 35 percent of the land area is utilized for livestock grazing purposes. Livestock represent the largest portion of cash farm income within the State. The largest crop is wheat, most of it being “winter” or “dryland” wheat. Other principal crops are barley, oats, hay, potatoes, corn, and sugar beets. Lesser crops include other grains, fruits, vegetables, berries, melons, dry beans, and alfalfa and sugar beets for seed. Range feeds and dryland crops in non-irrigable areas, particularly in the southern portion, often suffer from lack of moisture.

Mining and manufacturing are the two other basic industries in Utah. The State ranks high in the quantity and value of minerals it produces each year, mainly copper, lead, zinc, gold, and silver. Because of the dry climate, several companies have found it economically feasible to produce salt from the brine of the Great Salt Lake by the evaporation process.

Salt lake City is the commercial, industrial, and financial center of Utah. Three-fourths of the State’s population is concentrated within a 100-mile radius of that City, and well over one-half the people reside within 50 miles of Salt Lake City.

Tourists come to Utah primarily to visit historic Salt Lake City; to see the Great Salt Lake; to tour the park areas, including Zion National Park, Cedar Breaks National Monument, and Bryce Canyon National Park; and to fish in the cool mountain streams. Persons traveling in the State during the winter and early spring months should be

prepared for cold weather and snow. When crossing the less-frequently traveled desert areas of the western portion, motorists should carry a supply of fresh water as a safeguard, particularly during the summer months

Source: <http://www.wrcc.dri.edu/narratives/UTAH.htm> accessed on 12/8/03 Western Regional climate center

Geology

Geology in Utah is multifaceted, very interesting and instrumental in understanding the hazards within the state. The complexity has yielded some of the worlds most inspiring geologic features, such as the Water Pocket Fold of Capitol Reef National Park and the canyons and plateaus of Zion National Park. However complex, Utah's geologic history can be explained with broad generalizations, which serve as a good starting point for interpreting Utah's world-famous topography and scenery.

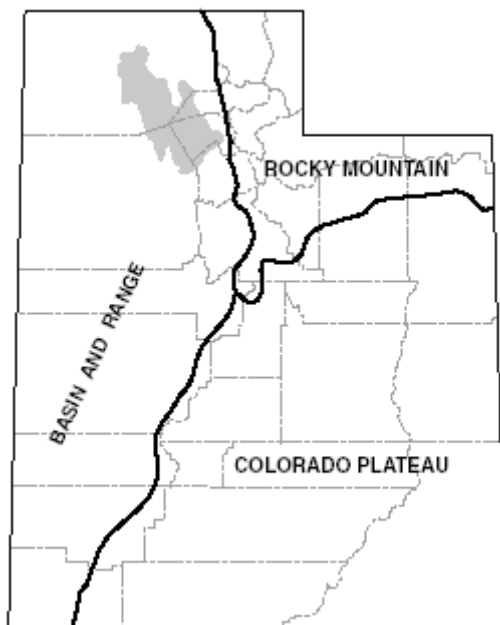


Figure I-1
Major Physiographic Provinces of Utah

Based on characteristic landforms, geologists and geographers have subdivided the United States into areas called physiographic provinces. Features that distinguish each province result from the area's unique geology, including prominent rock types, history and type of deformation (including crustal-scale forces of compression and extension), and erosional characteristics.

Utah contains parts of three major physiographic provinces: the Colorado Plateau, Basin and Range, and Rocky Mountains.

The three provinces meet near the center of the state, with the Basin and Range Province extending across western Utah, the Colorado Plateau across southeastern Utah, and the Rocky Mountains across northeastern Utah.

Where to draw the line between the Colorado Plateau and Basin and Range is subject to debate. Between the two provinces lies an area

that displays characteristics of both, and some geologists would make this area a distinct, fourth physiographic province called the Basin and Range - Colorado Plateau Transition. The same holds true for the area between the Rocky Mountains and Basin and Range provinces.

Additionally, each major province can be further divided into sub-provinces. Here, however, we will keep things "simple" and stick to highlights of the three major provinces.

Basin and Range Province

Steep, narrow, north-trending mountain ranges separated by wide, flat, sediment-filled valleys characterize the topography of the Basin and Range Province. The ranges started taking shape when the previously deformed Precambrian (over 570 million years old) and

Paleozoic (570 to 240 million years old) rocks were slowly uplifted and broken into huge fault blocks by extensional stresses that continue to stretch the earth's crust.

Sediments shed from the ranges are slowly filling the intervening wide, flat basins. Shorelines and sediments of lakes that intermittently cover the valley floors have further modified many of the basins. The most notable of these was Lake Bonneville, which reached its deepest level about 15,000 years ago when it flooded basins across western Utah.

Colorado Plateau Province

In contrast with the Basin and Range Province, a thick sequence of largely undeformed, nearly flat-lying sedimentary rocks characterize the Colorado Plateau province. Erosion sculpts the flat-lying layers into picturesque buttes, mesas, and deep, narrow canyons.

For hundreds of millions of years sediments have intermittently accumulated in and around seas, rivers, swamps, and deserts that once covered parts of what is now the Colorado Plateau. Starting about 10 million years ago the entire Colorado Plateau slowly but persistently began to rise, in places reaching elevations of more than 10,000 feet (3,000 meters) above sea level. Miraculously it did so with very little deformation of its rock layers. With uplift, the erosive power of water took over to sculpt the buttes, mesas, and deep canyons that expose and dissect this "layer cake" of sedimentary rock.

Of course, exceptions to this layercake geology do exist. For example, igneous rocks that cooled from onerising magma form the core of the Henry, La Sal, and Abajo Mountains, and several wrinkles or folds, such as the San Rafael Swell and Waterpocket Fold, can also be found as exceptions to the rule of flat-lying beds.

Rocky Mountains Province

High mountains carved by streams and glaciers characterize the topography of the Rocky Mountains province. The Utah portion of this province includes two major mountain ranges, the north-south-trending Wasatch and east-west-trending Uintas. Both ranges have cores of very old Precambrian rocks, some over 2.6 billion years old that have been altered by multiple cycles of mountain building and burial.

Uplift of the modern Wasatch Range only began within the past 12 to 17 million years. However, during the Cretaceous Period (138 to 66 million years ago), compressional forces in the earth's crust began to form mountains by stacking or thrusting up large sheets of rock in an area that included what is now the northeastern most part of Utah, including the northern Wasatch Range. This thrust belt was then heavily eroded. About 38 to 24 million years ago large bodies of magma-intruded parts of what is now the Wasatch Range. These granitic intrusions, eroded thrust sheets, and the older sedimentary rocks form the uplifted Wasatch Range as it is seen today.

The Uinta Mountains were first uplifted approximately 60 to 65 million years ago when compressional forces created a buckle in the earth's crust, called an anticline. The mountains formed by this east-west-trending anticline were subsequently eroded back down, but began to rise again about 15 million years ago to their present elevations of over 13,000 feet above sea level.

The Rocky Mountains province is further characterized by sharp ridgelines, U-shaped valleys, glacial lakes, and piles of debris (called moraines) created during the Pleistocene (within the last 1.6 million years) by mountain glaciers.

This is, of course, a most cursory overview of the geologic events that formed the topography of Utah's three physiographic provinces. Numerous anomalies and variations give color and detail to the big picture outlined here.

Derived: Glad You Asked article, [Survey Notes](#), v. 32 no. 1, January 2000

Economy

In the 1990s Utah's economy diversified, becoming increasingly integrated with the national economy and much less dependent on key industries such as federal government (defense) and mining. During 2001 a predicted slowdown in the Utah economy became pronounced after the September 11th terrorist attacks on the World Trade Center. While the national recession of 1991 was hardly felt in Utah, the current national recession is being mirrored in Utah. Since 1994, the peak year of the current cycle, the rate of job growth has fallen gradually from 6.2% to 0.9% in 2001. This is Utah's slowest job growth since 1983 and is only a fraction of the long-term average of 3.5%. Correspondingly, Utah's 4.4% unemployment rate for 2001 is a nine-year high. A monthly average of about 50,000 individuals were out of work in 2001.

The 2002 Olympic Winter Games will provide a temporary but timely boost in early 2002. However, economic activity will once again slow in 2002 as the Olympics wind down, and the year's economic performance will appear similar to that of 2001. Job growth will remain near 1% (12,000) and the unemployment rate near 5% (58,000 unemployed). Still, Utah's unemployment rate in 2002 should be lower and job growth higher than nationally. Assuming that the projections for a relatively shallow and brief national recession hold, after a few months' rest the Utah economy should rebound and by the end of 2002 it should be back on a moderate growth path. The Services industry will remain the largest source of new jobs and will continue to increase its share of total non-farm jobs. Manufacturing and mining job growth will be flat or negative, and the construction industry will contract noticeably.

Job Growth by Industry

Construction

The record-breaking 11-year expansion in Utah's construction industry ended in 1999. 2001's net loss of some 2,000 jobs is the second year of the long-anticipated downturn as major projects have been completed. With fewer construction projects anticipated for 2002, a loss of an additional 5,500 jobs is possible. Nonetheless, construction jobs in 2002 will still be 5.8% of total non-farm jobs (slightly above the 1978 to 2002 average of 5.5%). Long-term, the downturn should be brief; with more major projects on the horizon.

Manufacturing

During most of the 1990s, Utah manufacturing expanded rapidly, increasing 26% from 1991 to 1998. By contrast, the United States' gain was only 2%. However, in both 1999 and 2000 about 1,200 jobs (-1%) were trimmed from manufacturing payrolls, followed

by an additional cut of 3,800 in 2001. Substantial layoffs in late 2001 should continue this trend through 2002.

Transportation/Communications/Utilities

The T/C/U division in 2001, a growth rate of 0.3%, added only 200 net new jobs. This is a sharp drop from 2000's 2.4% expansion. Most transportation-related industries achieved at least modest growth. However, this was offset by a sharp loss in communications employment. The Olympic Winter Games are expected to give this division a boost in early 2002; and growth will improve slightly from 2001's dismal mark.

Trade

Beginning in 1999, the economic slowdown sharply slowed the trade division's job growth, culminating in 2001's anemic 0.1% (400 jobs) expansion. Wholesale trade suffered a loss of 1,000 jobs; retail trade's 1,400-job gain was led by growth in department stores and restaurants but offset by losses in most other categories of retail trade. In 2002, portions of the trade division will benefit from the Games, but the start of economic recovery will provide a much stronger lift. The division should generate about 3,000 new jobs, growing by about 1%, in 2002.

Finance/Insurance/Real Estate

Sparked by rapid employment expansion in personal credit institutions, banks/credit unions, and security brokers; the finance, insurance, and real estate division posted a 2,900-job, 5% growth in 2001. Growth, however, will probably slow to less than half that pace in 2002.

Services

In 2001, most industries within Utah's services division demonstrated respectable employment gains. Notable were health services' 2,700 (4%), amusement/recreation services' 1,200 (7%), and engineering/management services' 1,300 (5%). On the other hand, business services lost 4,000 jobs (personnel supply lost 3,100 and computer/data processing lost 1,800). The division's growth rate of 2.2% for 2001 was the slowest in several decades. For 2002, far fewer business services cuts are anticipated, and the Olympic Winter Games will stimulate thousands of temporary jobs. With modest expansion in most industries, the division should generate 10,000 net new jobs, a growth rate of 3%.

Mining

Utah's mining division lost about 150 jobs in 2001. However, this net loss obscures some disparate gains and losses in the component industries. Oil and gas extraction activities added about 550 jobs, but these were more than offset by cutbacks of 400 in coal mining, 200 in metal mining, and nearly 100 in nonmetallic minerals mining. For 2002, coal mining should stabilize, metal mining may continue to slide, and oil and gas extraction could peak and start declining; yielding a projected net loss of 200 jobs.

Public Sector (government)

In both 2000 and 2001, government employment in Utah expanded more rapidly than usual. Federal job growth was due to 1) the 2000 Census (temporary jobs) and 2) new defense assignments at Hill Air Force Base. In addition, the non-education side of local government has grown rapidly, especially in 2001. Total government in 2001 grew by about 5,900 jobs (3.2%). The public sector should return to more typical growth in 2002, which means overall growth of about 4,800 jobs and 2.5%.

Wages

In 2001, Utah's average annual nonagricultural pay was \$29,700—up 3.1% from the 2000 average. This is the seventh year in a row that average wage increases in Utah have outpaced increases in inflation, as measured by the U.S. Consumer Price Index (CPI-U), but they are still only 83% of the U.S. average. The loss of high-paying mining and metals-producing jobs in the early and mid-'80s helped contribute to the decline. However, Utah's demographics also play a part. Utah has a large percentage of young people in the labor market and a relatively young labor force. Young people are usually paid less than older workers. In addition, Utah has a higher proportion of part-time workers than the U.S. in general, which also tends to pull the average wage down. Shortages of workers from 1996 through 2000 are thought to have been a factor in the relatively rapid wage increases of those years, but average annual pay in 2002 will likely slow with the economy.

Major Employers

With about 22,000 employees, the State of Utah ranks as the largest employer. IHC, a large health-care organization with several hospitals and clinics, ranks number two, also with about 22,000 jobs. Six of the next nine top employers provide educational services. The University of Utah (including the University Hospital) and Brigham Young University each have roughly 17,000 employees. Granite, Jordan, and Davis school districts and Utah State University each have between 6,500 and 8,500 workers. Hill Air Force Base, with 11,000 civilian jobs, occupies the number five rank. Convergys, a multi-county telemarketing company employing roughly 8,500, is in sixth place. Department store and grocery store chains, the U.S. Postal Service, and the Internal Revenue Service, are prominent employers. Salt Lake County government, other major retail chains, additional large school districts, Autolive ASP, and Delta Airlines each also have a strong presence in Utah's economy.

2002 Winter Olympic Games

The 2002 Olympic Winter Games will generate significant economic impacts in Utah between 1996 and 2003. The total amount of spending directly related to the Olympics is estimated to be approximately \$2.1 billion. There are five main sources of Olympic related spending:

- Salt Lake Olympic Organizing Committee (SLOC): \$1,240 million
- Infrastructure investment: \$435 million
- Visitor spending during the Olympic Games: \$348 million
- spending to broadcast the Games: \$99 million
- Direct federal funds to state government for Olympics operations: \$17 million

Only \$1.3 billion, however, actually impacts the Utah economy, because much of the value of the goods or services used to host the Olympics is generated out of state; e.g.,

most of the airfare visitors will pay to fly to Salt Lake goes to support airline operations outside Utah. The total employment impact is estimated to be 35,424 job years. Employment grows from 1,148 in 1997 to 25,070 during February 2002; almost doubling from 7,317 during 2000 to 12,590 during 2001, doubling again during the Games, before falling off to an average of 6,409 for 2002. Trade and construction in the services sector, including SLOC employees, follow the largest employment impacts. Employment growth rates in 2001 and 2002 would be much lower were it not for the Winter Olympics.

Net Migration

Population growth should slow in the months after the Olympics as construction slows and many of those helping to host the Games leave the state. The post-Games lull could be accentuated by a national/global recession that lasts longer than mid-2002. During 2001 Utah's net migration remained strong at 14,166. During 2002, however, the number of in-migrants is expected to exceed the number of out-migrants by only 3,000. Still, with an expected record number of births, population will grow 1.7% in 2002.

Source: <http://dced.utah.gov/BIRS/state/STATESUM.htm> accessed on January 28, 2004